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THE LABORS OF SISYPHUS

ACCORDING to Greek legend, the Titan Sisyphus was condemned by the gods—for crimes forgotten by most who remembered his cruel punishment—to eternal frustration. He had to roll a heavy rock up a steep mountain; whenever the top was in sight, the rock slipped and rolled down the slope, and the weary Titan had to start from the bottom again.

The task of getting Congress to understand the position of science in national affairs proves to be as frustrating as the labors of Sisyphus.

Since 1945 scientists and their friends in Washington have attempted again and again to impress upon Congress the simple truth that all technological progress (including that of military technology) is but a by-product of the advancement of fundamental knowledge; that one cannot foster the first and neglect the second any more than one can produce good fruit or flowers without growing plants with healthy roots. To let basic scientific research deteriorate because it does not promise immediate practical return would be as improvident for a nation as for a farmer to neglect planting the seeds for next year's harvest (even if he might still be cashing in on last year's crop).

★ ★ ★

Occasionally, in the past five years, it looked as if this simple truth had been grasped even by the most obstinately anti-intellectual Senators and Congressmen. It seemed as though scientists could go back to their laboratories in the certainty that the moment they turned their backs on Washington, Congress would not declare science a luxury. And yet, in August 1951, the Appropriation Committee of the House of Representatives did just that.

Because—as the committee stated in its report—fundamental research does not promise immediate contributions to the national mobilization effort, it clipped no less than 98 per cent from the appropriation for the National Science Foundation! Just enough money was left to pay the salaries of the head of the Foundation and a few of the secretaries. Having thus relieved the nation's budget of a "luxury" item of fourteen million dollars, the Appropriation Committee can now go back with vigor to signing multi-billion-dollar blank checks for "practical" science, such as new atomic plants and "mystery weapons."

As this is written there is still hope that this crippling decision may be reversed in the Senate, and that at least a part of the National Science Foundation funds can be restored in the final version of the appropriation bill. But the mere fact that in the year 1951 a prominent group of American lawmakers could decide that basic scientific research is a luxury, and can wait for national support until better times, is a frightening experience for all believers in the collective wisdom of a self-governing nation.

Since the end of the war, the vastly enlarged scientific research establishment of America has been kept going, in universities and research institutes, largely through the financial aid of the Armed Forces and the Atomic Energy Commission. Military leaders possessed the enlightened understanding of the importance of pure science which Congress lacked. With their billion-dollar budgets, they were able to take in their stride the spending of a few millions every year on the support of fundamental research. However, the Office of Naval Research (and its counterparts in other branches of the Defense establishment) have never considered themselves as more than temporary "angels" of American science, ready to relinquish this role with the appointment of a legal guardian.

Presently, with full mobilization at home and actual war in Asia, the military have less and less time, energy, and even money to devote to playing foster-mother to American science. When, after many vicissitudes, the National Science Foundation Bill was finally passed by Congress and signed by the President on May 10, 1950, military agencies were all set to transfer most of their activities to the new Foundation, and to make available to the latter the experience they had accumulated. They must now themselves feel like a policeman, who, upon having assisted the birth of a baby in the police cruise car, is refused admittance at the doors of a hospital—while his radio calls for all hands to help in pursuit of armed robbers.

★ ★ ★

The strength of America is based on mass education and wide diffusion of scientific and technical knowledge. The American military establishment is superior to that of other countries, not in the toughness of its soldiers or discipline and morale of its combat units, but in its better developed intelligence, more extensive technical training, and its modern equipment.

Therefore, the American military establishment has a vital interest in a high level of general and technical education, as well as in vigorous pure and applied scientific research in this country. In emergency, the military establishment may therefore feel that it is within its competence to assist national education as well as the national research effort. It is, however, as abnormal for the armed forces to finance scientific research outside its own laboratories, (such as the Naval Research Laboratory, or the Aberdeen Proving Grounds) as it would be for the military to take over continuous financial responsibility for American colleges, other than West Point and Annapolis.

Imagine what would have happened if private funds and civilian authorities had failed to provide means for higher education in the country, and the Army and the Navy jumped in with grants from their vast budget! This would have caused loud protest across the nation. People would be horrified to see their colleges treated as if they were institutions required primarily for the success of universal military training. *Yet, a similar situation has existed for six years in American science!*

It has been treated as if it were deserving of national support only to the extent the military think they need it—and the military was therefore considered the proper agent to support it. For six years, scientists have worked to convince Congress that this attitude

is fundamentally wrong. They had finally succeeded when the National Science Foundation was established—but it seems that they may have to start from the bottom again.

Perhaps, actions such as that of the Appropriations Committee reveal not merely an indifference to science, but a sub-conscious hostility to it. This hostility has existed ever since science became an important agent of progress and change in society; it has not diminished, but rather increased in times when science has produced its most spectacular achievements.

An anti-scientific, anti-rational state of mind has been a part of the wave that carried Hitler upward; not for nothing was his accession to power celebrated by the burning of books. An anti-scientific trend is clearly discernible in the present policy of the Soviet dictatorship, completing its path from pretended extreme rationalism to completely irrational belief in verbal shibboleths, and divine wisdom of anointed leaders. It is well to remember that even in America, whose rise to prominence has been manifestly tied up with successful practical application of science to all branches of human activity, the distrust of the scientific mind and disbelief in the general soundness of scientific methods, is widespread. Here, too,, science is a magic bird whose golden eggs everybody wants, but whose free flight into regions inaccessible to most makes it a suspect creature.

Yet it is in these flights into the unknown that science gathers the food that makes it grow. Put it into the most luxuriously equipped henhouse, and after a while there will be no more golden eggs.

—E. R.

"Let you in on a secret. There's a connection here."

Courtesy of the Washington Post and Herblock

THE NSF STORY

The appropriation for the National Science Foundation is still in doubt as this issue goes to press.

But the fact that Congressional action on NSF's appropriation is a tragically significant chapter in the history of public education on the aims of research can hardly be in doubt.

This newest chapter in the NSF story began June 6, when a House subcommittee heard witnesses for the Foundation, led by Dr. Alan T. Waterman, Director of the NSF, and Dr. Detlev Bronk.

Dr. Waterman addressed himself directly to the question of explaining the nature of "basic research," but questioning from the Congressmen showed bewilderment as to how the government could direct science any more than it could direct art or literature."

Representative Albert Thomas of Texas assured Dr. Waterman "you will certainly make a success of this, and this committee is going to do its best to cooperate with you and help you. . ." —and the next headline in the news came August 20 when this committee slashed the projected budget from the asked-for fourteen *million* down to three hundred *thousand* dollars.

Whether this news simply stunned scientists or whether perhaps most of them were away on summer vacations at this time, it was noted in Washington that neither scientists nor their organizations, with the outstanding exception of the Federation of American Scientists, went "to bat" for NSF as they once did in such political crises.

In September a Senate committee heard Waterman, Bronk, and some additional witnesses, including Dr. J. R. Oppenheimer, speak for a restoration of the cut.

Senator Smith of New Jersey also appeared for the NSF.

When the committee reported to the Senate in October that the appropriation should be six million three hundred thousand dollars, Smith urged that it be raised.

He was joined by Senators McMahon, Douglas of Illinois, Lehman, Ives, and Margaret Chase Smith, in that proposal.

Without even taking a record vote, however, the Senate sent the appropriation to conference at the committee's figure.

Note

Other editorials will be found on pages 318–19.

Excerpts from

The Forrestal Diaries

"The Story of a Nation's Deepening Crisis"

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Not the least significant of the dangerous results of secrecy is that even long after the technical secrecy may have ended, the real history of decisions of the highest national importance is still locked in security safes. Or else publication of accounts is so diffused, scattered, or incoherent that for all practical purposes the factors in many great decisions remain merely a part of our growing body of secret history.

This conclusion and the fact that lack of understanding of the past continues to hamper our understanding of the present—and the future—will occur to many readers as they scan the following excerpts from the "diaries" of the late Secretary of Defense, James Forrestal.

Believing that it was important to print these diaries speedily for our audience, we did not wait for commentary nor take time to supply authoritative footnotes on some of the factual errors and misunderstandings described or revealed by the book.

In our presentation we have indicated with square brackets the commentary supplied by Mr. Walter Millis, editor of the diaries.

At a later date the Bulletin *hopes to present some detailed analysis of the history recounted in these excerpts. Meanwhile, it invites correspondence and contributions from its readers. A second installment and perhaps a third will follow this extract from* The Forrestal Diaries.

—The Bulletin Staff

THE ATOMIC BOMB IN WORLD WAR II

8 March 1947

Meeting with McCloy

. . . McCloy recalled the meeting with President Truman at the White House at which the decision was taken to proceed with the invasion of Kyushu. He said this for him illustrated most vividly the necessity for the civilian voice in military decisions even in time of war.

. . . McCloy said he had not been asked but wanted to state his views. (Neither Stimson nor I was at this meeting.) He said that he thought before the final decision to invade Japan was taken or it was decided to use the atomic bomb political measures should be taken; the Japanese should be told of what had happened to Germany, particularly in view of the fact that some of their people who had been in Germany were back in Japan and would be able to report on the destruction and devastation which they had witnessed; that the Japs should be told, furthermore, that we had another and terrifyingly destructive weapon which we would have to use if they did not surrender; that they would be permitted to retain the Emperor and a form of government of their own choosing. He said the military leaders were somewhat annoyed at his interference but that the President welcomed it and at the conclusion of McCloy's observations ordered such a political offensive to be set in motion.

★ ★ ★

15 July 1945

Japanese Peace Feeler

Messages today on Japanese-Russian conversations. . . . Throughout Sato's message ran a note of cold and realistic evaluation of Japan's position. . . . The gist of his final message was that it was clear that Japan was thoroughly and completely defeated and that the only course open was quick and definite action recognizing such fact. . . .

It is significant that these conversations began before there could have been much effect from the thousand-plane raids of the Third Fleet and several days before the naval bombardment of Kamaishi.

[. . . These conversations also took place nearly a month before the dropping of the atomic bombs on Hiroshima and Nagasaki.]

10 August 1945
Surrender

. . . I telephoned the President congratulations . . . on the indicated surrender of Japan. . . . It was agreed that we should await formal receipt of the surrender offer. Justice Byrnes raised the question of whether the offer accorded with our terms of "unconditional" surrender. Admiral Leahy thought it did but Byrnes felt that we might be exposed to the criticism that we had receded from the totality and severity of the Potsdam Declaration. I said that I felt this could be met by an affirmative statement on our part in which we could see to it that the language of surrender accorded fully with our intent and view.

The Secretary of War made the suggestion that we should now cease sending our bombers over Japan; he cited the growing feeling of apprehension and misgiving as to the effect of the atomic bomb even in our own country. I supported his view and said that we must remember that this nation would have to bear the focus of the hatred by the Japanese. . . .

★ ★ ★

10 August 1945
Cabinet

The President observed that we would keep up the war at its present intensity until the Japanese agreed to these terms, with the limitation, however, that there would be no further dropping of atomic bombs. He said that he expected it would take about three days before negotiations were completed.

★ ★ ★

29 May 1947
Luncheon

[At a luncheon with McCloy, Sherman and others a week later the interest was, for the moment, historical. McCloy "said he was writing a piece for *Foreign Affairs* on the major strategic decisions of the war" and asked opinions as to what these were. After discussing a number of the major decisions—to land in Normandy, to concentrate the Fleet before Midway and so on—McCloy mentioned the decision to use the atomic bomb against Japan. Forrestal queried this.]:

. . . I raised the question of whether this did turn out to have been a sound decision or not, in view of the exchange of dispatches between Sato in Moscow and the Japanese Foreign Office which, by mid-July 1945, clearly indicated the hopelessness of the Japanese situation.

7 September 1945
Cabinet Meeting

. . . Mr. Leo Crowley said that he had just returned from the Middle West and was sure that the country would be violently opposed to the continuation of any universal military training. He said the assumption was that we had fought a war now to get rid of war, that we had the atomic bomb and we had the San Francisco Conference and all the various affirmations of faith in the possibilities of an organization to create the foundations of world peace, and that universal training would create the inference that we didn't have faith in our own platform. To this Secretary Stimson made an eloquent rejoinder, the substance of which was that the only way we could convince the world we *were* serious about preventing another war was to show that we took our responsibility in that direction with great seriousness. I supported the Secretary of War's point of view and remarked that history showed that all new weapons always developed a countermeasure, beginning with what the Romans developed to counteract Hannibal's use of elephants. . . .

HENRY WALLACE'S VIEW

[The Cabinet meeting on September 21 (1945) was "occupied entirely with a discussion of the atomic bomb" and was clearly fundamental in the formulation of American policy on this new and dread subject.

[The question was presented in the form of what should be "the policy of this government in making available information in our possession to other nations." Beginning with Mr. Stimson, the President went round the table. According to Forrestal's notes, the Secretary of Commerce, Mr. Henry Wallace, was "completely, everlastingly and wholeheartedly in favor of giving it to the Russians. Commented on . . . the statement that Russian ambitions in China, Korea and Mongolia have not yet been sufficiently defined for us to have trust. He said the real reason for the Chinese-Mongolian disaffection was that the Chinese were primarily a farming people and the Mongolians a cattle-breeding or livestock people. Science cannot be cribbed, cabined or confined; scientific knowledge is bound to spread over the world. He questioned the statement that the Russians were Orientals. He said that particularly in Mongolia they had a Western viewpoint in contrast to that of the Chinese. Failure to give them our knowledge would make an embittered and sour people." This trusting view was not shared by the others. It is clear that ideas had not yet fully crystallized (and most of those present still had a very imperfect knowledge of the subject); and there were varying shades of emphasis given to several factors that had to be weighed. Some, going on the assumption that it would be impossible to keep the secret anyway, were more inclined to favor publicity; others would "give them (the Russians) nothing until they have demonstrated a willingness to work with us."

[The underlying attitude of nearly all seemed closely in accord with Forrestal's contribution. He made the point that the bomb and the knowledge that produced it were "the property of the American people," which the administration could not give away until they were very sure that it was the sense of the people that they should do so. He reminded them that in World War I the Japanese had been among the allies, like the Russians in World War II; that we had afterward made naval agreements with the Japanese which we had lived up to but which they had not, and that "the Russians, like the Japanese, are essentially Oriental in their thinking, and until we have a longer record of experience with them on the validity of engagements . . . it seems doubtful that we should endeavor to buy their understanding and sympathy. We tried that once with Hitler. There are no returns on appeasement." He added that "trust had to be more than a one-way street; just as certain nations were proposing to exercise trusteeship over certain areas of the globe on behalf of the United Nations, so it seemed to me that we could exercise a trusteeship over the atomic bomb on behalf of the United Nations and agree that we would limit its manufacture for use on such missions as the United Nations should designate."

FORRESTAL URGES SOLE TRUSTEESHIP

[The idea of a sole trusteeship (if that was what Forrestal had in mind) seems to have got no support, but the idea of submitting the matter for adjustment under the machinery of the

United Nations became basic to subsequent American policy. And another idea—expressed in various ways by several participants in the conference—became equally basic. This was the idea that we should offer to publish our data in return for a proper *quid pro quo* from the Russians in terms of equal publicity and acquiescence in adequate regulatory measures. This Cabinet on September 21 laid the foundations upon which there were erected, in turn, the Lilienthal-Acheson report, the Baruch Plan and the United Nations majority program. As the Cabinet ended, the President, according to Forrestal's notes, "said he wanted to invite a memorandum from all hands summarizing the views they had expressed; he said he did not propose to act without the concurrence of Congress; that he had taken an obligation, however, to send a message with his recommendations. He said there would be another discussion next week at which he would announce his own conclusions."

[Forrestal's notes do not show whether or not the President did announce a decision at the Cabinet of the following week, but he followed the advice, which several had tendered, to move slowly. His message to Congress of October 3, asking for the establishment of a domestic Atomic Energy Commission, made it plain that he would proceed to develop an international atomic policy only after prior discussion with Great Britain and Canada and then a thorough exploration of the field with other nations.]

★ ★ ★

16 October 1945
State-War-Navy Meeting

Mr. Patterson next raised the question as to discussions with the British and Canadians relative to atomic energy. . . . This led to a discussion of the question as to whether or not this country should make available to the Russians information concerning atomic energy. . . . Mr. Byrnes [who had been absent when the same matter was raised at the Cabinet on September 21] indicated that he was most strongly opposed to imparting any of this information to the Russians. He stated that he felt that undue emphasis was being given to the views of the scientists on this subject. He said that while it was all very well for the scientists to say as they did that science has no boundaries, that certainly did not apply to either Mr. Molotov or Mr. Stalin; that in his view it is idle to expect that we would be allowed any access for purposes of inspection of Russian factories producing atomic bombs when we cannot even gain access to Hungary or Poland. . . . In response to Mr. Patterson's questions Mr. Byrnes stated that in his view the Russians were quite serious in their demand for Tripolitania and were pressing it most strongly. . . .

★ ★ ★

[On the day (April, 1946) that Bedell Smith was talking to Stalin, Senator Claude Pepper of Florida was talking to the Senate; Forrestal also had extracts from this effort copied into his diary. Senator Pepper, answering Winston Churchill's Fulton speech, was anxious that no one should "gang up" on Russia; all he wanted was that the United States should "not become a guarantor of British imperialism." His recommendation for a foreign policy was that the United States should take the lead in calling a Big Three conference to settle everything; and that before the conference convened we should "destroy every atomic bomb which we have" and smash every facility for their manufacture.]

INTERNATIONAL CONTROL AND DISARMAMENT

6 November 1946
State-War-Navy Meeting

Acheson said that the U.S. position on disarmament [a subject the Russians were then vigorously pressing in the United Nations] was confused and that he was communicating with Byrnes and Baruch [who had been appointed as American representative on the United Nations Atomic Energy Commission] on it. He thinks that Molotov's proposal on world-wide disarmament can be used to point up the fundamental obstacles blocking international acceptance, such as Russian positions on inspection [of atomic weapon] development, exchange of information, etc. The State Department's present position is that the U.S. should not be drawn into a general disarmament discussion but should make it clear that such discussions are contingent upon international acceptance of accessibility of territory for inspection and a free interchange of information. Baruch intends to press for a vote on the atomic energy control to focus attention on the Soviet's stand. I mentioned that satisfactory conclusion of peace treaties should also be included in any such statement of policy. . . . Acheson said he thought the point could be worked in.

[A day or two later Forrestal entered in his diary the gist of an intelligence report on Soviet atomic strategy. This represented Soviet policy as one of pressing for disarmament and

Biographical Note

James Vincent Forrestal was born on February 15, 1892, at Matteawan (now Beacon), N.Y., the son of a builder and contractor who had immigrated to this country from Ireland as a boy.

Upon graduation from high school, Forrestal spent three years in the offices of various local newspapers, and in 1911 enrolled for courses at Dartmouth University, transferring the next year to Princeton. During his senior year, his class voted him the one "most likely to succeed."

In 1916 Forrestal entered the investment and banking house of William A. Read & Co. The following year, Forrestal enlisted in the Navy and at the armistice was retired with the rank of Lieutenant, J.G. He then returned to his former business affiliation, becoming a partner of the Dillon, Read Co. in 1923.

In 1926 Forrestal married Mrs. Josephine Ogden; they had two sons; Michael and Peter. Forrestal succeeded Clarence Read as president of the Wall Street firm in 1938.

In 1940 Forrestal was called to Washington by President Roosevelt to become a special administrative assistant. On the 22nd of August, he was sworn into the newly-created post of Under Secretary of Navy. On May 19, 1944, Forrestal replaced Frank Knox, upon the latter's sudden death, as Secretary of Navy. During the summer of 1947, he became the first Secretary of Defense, from which position he resigned in March, 1949. His death occurred on May 22 of the same year.

outlawry of atomic weapons on the world stage while refusing to allow any inspection of Russia's own atomic activities. The result would be to create a world opinion that would force the Western powers to disarm and drop their atomic development, permitting the Soviet Union to continue its own atomic operations while the West slept. Forrestal made no comment; but this kind of thing cannot have diminished his own restless yearning for a greater unity, coherence and precision in democratic policy.]

★ ★ ★

29 November 1946
Cabinet Meeting

The President said he would state his position on disarmament and asked for expressions of opinion or if there were any in disagreement with those views. His position was this: That he would be in favor of disarmament once the major questions involved in a global plan were disposed of, such as inspection of manufacturing of munitions, manufacturing facilities of atomic energy resources, etc.; that he was not willing to place this country in the position which it had been placed in by the 1922 [Naval Disarmament] Conference, namely, that of a unilateral disarmament with the resulting weakening of our position in the world. All hands at the Cabinet agreed completely with his statement.

The Acting Secretary of State, Acheson, added the comment that he thought Senator Austin, who was pressuring for a declaration of American policy on this subject, had been frustrated, misled and confused by the Russian maneuvers since last spring, in their effort to get off the hook on their refusal to accept the principle of inspection on atomic energy. He said that it should be made clear to Austin by the President, as it had been by Byrnes, that the American position was that we were quite willing to support any disarmament program provided that it was a universal one and did not result in our stripping ourselves of our weapons while others retained them. . . .

★ ★ ★

29 January 1947
State-War-Navy Meeting

. . . General Marshall explained that the other members of the Security Council were unanimous in the belief that the Council should go ahead with the discussion of the general problem of disarmament. He believed that other nations would take a solid vote against us should we propose otherwise. He said Senator Austin and Mr. Baruch shared the view that it would be unwise for us to eliminate the atomic bomb until other matters in the field of regulation were well along. Admiral Nimitz suggested that in view of present circumstances U.S. position should be that committee discussions should be directed toward the problem of *how* and *when* to regulate armaments rather than *what* to regulate. He said that the important thing was to establish methods of inspection and control, and also to establish criteria of world conditions, such as conclusion of peace treaties and establishment of forces under the Security Council as prerequisite to undertaking general disarmament. There was complete acceptance of these views after considerable discussion. . . .

★ ★ ★

27 March 1947
Meeting of State-War-Navy Department Heads

Meeting held 26 March 1947.

Mr. Austin stated that he felt that considerable progress with the Russians had been made [in regard to atomic energy]. However, the Russians' stand on specific issues could not be determined and would only come forth when specific proposals come up for consideration of the [U.N. Atomic Energy] Committee.

I cautioned that public opinion might become oversanguine if too great importance was placed on minor conciliation by the Russians and stated that in the proposed aid to Greece and Turkey apparently a large part of the public was of the opinion, due to overstressing the United Nations' capability, that the United Nations could handle a problem of this nature. The growth of similar misconceptions with regard to the atomic energy problem should be avoided.

Mr. Lilienthal stated that control of production of atomic energy for industrial purposes could not be separated from the control of production of atomic weapons. . . .

The Secretaries were in general agreement that Senator Austin should endeavor to bring up at first priority in the Atomic Energy Committee the matter of establishing a charter for an international agency for inspection, supervision and control of atomic energy. . . .

★ ★ ★

3 April 1947
U.N. Atomic Energy Commission

. . . Senator Austin voiced again his definite optimism with regard to progress in the treatment of the atomic energy matter in the United Nations. . . .

Mr. Osborn [Frederick Osborn, Deputy Representative on the U.N. Atom-

A Note on the Diaries

Forrestal began compiling his diaries shortly after he became Secretary of Navy in 1944; he brought them to a close upon his resignation as Secretary of Defense five years later.

The diaries are actually an accumulation of private notes and papers, memoranda, records of conversations, interviews, and occasional reflective comments. Probably intended as source material of private information for a book which he hoped eventually to prepare, Forrestal turned over the entire record to the White House for safe keeping because of its confidential nature.

In collaboration with Eugene S. Duffield, assistant publisher of the Cincinnati Enquirer and wartime assistant to Mr. Forrestal, those papers which were judged of greatest public interest were selected by Walter Millis, assistant chief editorial writer of the New York Herald Tribune and author of The Road To War and This Is Pearl. The volume from which the present extracts are drawn was compiled from fifteen loose-leaf notebooks, over 2,800 typewritten pages.

At the present time, approximately one-sixth of the text is appearing in newspapers throughout the country. Most of the extracts appearing in the Bulletin have not previously appeared in other periodicals and dailies but are drawn exclusively from the complete, copyrighted book text.

ic Energy Committee] was in general agreement with Senator Austin except that he did not breathe the same degree of optimism. However, he did think that if agreement was reached on the minor and semi-important issues, changing world conditions and world opinion might force Russia to accept agreement on a complete control of atomic energy. . . .

Mr. Acheson pointed out the relatively little progress to date on atomic energy and stated that worthwhile progress on major issues was essential for determination of our future national policy. . . .

★ ★ ★

[The extent to which the atomic bomb was slowly emerging as a pivotal point in American politico-strategic thought is indicated by an entry a few days later (October, 1947) on a meeting with Ralph Bard—who represented the United States in the U.N. negotiations over conventional armaments—Lovett, Eisenhower and Gruenther. Bard felt himself hampered by the Joint Chiefs of Staff position that there should be no further discussion of conventional armaments until atomic weapons had been dealt with. "Eisenhower made the point, which Bard had apparently not heard before, that it would be dangerous" to proceed with conventional armaments "until the Russians had agreed to a workable plan of inspection," since if we agreed to a plan for conventional weapons without rigid inspection requirements the Russians could move for the application of the same formula to atomic weapons. In Eisenhower's opinion, "any agreement about atomic weapons without enforceable methods of inspection would be most dangerous for the U.S."]

★ ★ ★

[Forrestal's diary records a variety of matters in these fall days (of 1948). At a State-War-Navy meeting on November 20, Acheson, in response to Forrestal's inquiry, said that State had developed a policy on disarmament; the essence of it was that "we shall take a strong attitude to make the Soviets face up to their position on international control of atomic energy, which by denying rights of inspection, etc., blocks all progress on this matter."]

★ ★ ★

THE BOMB IN THE COLD WAR

8 December 1947

To Chan Gurney

. . . At the present time we are keeping our military expenditures below the levels which our military leaders must in good conscience estimate as the minimum which would in themselves ensure national security. By so doing we are able to increase our expenditures to assist in European recovery. In other words, we are taking a calculated risk in order to follow a course which offers a prospect of eventually achieving national security and also long-term world stability.

If we refuse to take such a calculated risk we will be forced into one of the two unacceptable alternatives of the *Vermillion* editorial[1] and the problem will not approach solution during the years immediately ahead.

During those years—of which the exact number is indeterminate—we will continue to have certain military advantages which go far toward covering the risk. There are really four outstanding military facts in the world at this time. They are:

1) The predominance of Russian land power in Europe and Asia.

2) The predominance of American sea power.

3) Our exclusive possession of the atomic bomb.

4) American productive capacity.

As long as we can outproduce the world, can control the sea and can strike inland with the atomic bomb, we can assume certain risks otherwise unacceptable in an effort to restore world trade, to restore the balance of power—military power—and to eliminate some of the conditions which breed war.

[1] A newspaper editorial, arguing that in Europe we had but two alternatives: to stay in force, using many more troops than were there in the winter of 1947, or to get out.

The years before any possible power can achieve the capability effectively to attack us with weapons of mass destruction are our years of opportunity.

[In Forrestal's thought, the atomic bomb had already moved into the center of the international equation. (He had apparently not been impressed by Molotov's veiled, if boastful, warning of the month before.)[2] He was still uncertain whether the country would be resolute in the bomb's use; at the time we were still bound by the secret Quebec Agreement with Britain and Canada, and even months later, long after the agreement had been adjusted, he was asking every casual visitor to his office whether in his opinion the public would support the employment of the bomb in the event of a major war. Whatever Forrestal's doubts on this score, he was willing, because of our supposedly exclusive possession of the atomic weapons, to accept a policy which was cutting our other forms of military power virtually to impotence in order to finance European economic and political recovery and stability.]

★ ★ ★

19 March 1948

Secretary Royall et al.

Meeting at Secretary Royall's office with Admiral Strauss, Dr. Ernest O. Lawrence of the University of California, Dr. Irving Langmuir of GE, and Colonel Kenneth D. Nichols. Lawrence's proposal was a plan to use AE in a different form and deny the use over great areas such as cities and industrial centers, etc., to massed population, but do it in a way that would not expose such populations to extermination.

[2] On November 6, 1947, Molotov, speaking in Moscow, had declared "In expansionist circles of the U.S.A., a new peculiar sort of illusion is widespread—faith is placed in the secret of the atomic bomb, although this secret has long ceased to exist."

Editor's Note—

This concludes the first installment of the excerpts from THE FORRESTAL DIARIES, which the Bulletin *editors judged to have an important or interesting bearing upon decisions of domestic and international atomic policy.*

Another installment of such excerpts from THE FORRESTAL DIARIES will be printed in next month's Bulletin.

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ATOMIC WEAPONS AND DEFENSE

BRIEN E. McMAHON

In the speech here reprinted, Senator Brien E. McMahon, Chairman of the Joint Congressional Committee on Atomic Energy, discussed on the Senate floor September 18, 1951, "the tragedy of our time" as it is illuminated by the increasing production of cheaper and more plentiful atomic bombs.

Two of the main points of the speech—that the whole American military establishment should be built around atomic weapons, and that this could save half of our national arms budget—have caused violent controversy. Some immediate reactions are summarized on following pages. The Bulletin hopes to present considered comment later.

Because of the limitations of our space, Senator McMahon's speech has been slightly cut in preparing it for publication, but 90 per cent of the text is given.

THIS, in a word, is the tragedy of the last six years: sixty thousand dead at Hiroshima and now sixty billion American dollars to keep Hiroshima from happening again.

Our people devoutly seek a just peace. They seek a decent and hopeful future, not for themselves alone but for all men everywhere. Now the arms race drives and goads them to spend sixty billion dollars, not for conquest but to deter conquest—not for war but against war.

A short three years ago we groaned at spending ten billions to discourage Soviet aggression. Today we must spend, not ten billions, but six times ten billions. Sixty billions for deterrence this year, and I fear seventy billions next year, and I fear eighty billions the year after—can we forever scale these giddy heights without crashing downward? May not history someday come upon the bones of a broken economy and a bankrupt people?

But a failure to spend and tax—a failure to appropriate increasing billions—may spell failure to keep open the future for peace. Either we will walk in the valley of the shadow of death and war or else we struggle up a mountain of debt and taxation. Such is our dilemma.

Make no mistake: this year's budget and next year's will not by themselves break our economic backs. As a matter of fact, our economy has never been stronger than today, and time and again it has proven its ability to withstand huge stresses and strains. But if the budget is to pyramid in the future as fast as it has in the past, all sober-minded men must feel grave concern.

Yes, we must work to cut out waste. Yes, we must work to banish extravagance. But these are not the prime danger to America's economy. It is the solid and irreducible cost of the steel for a tank and the fuel for a bomber and the leather for a soldier's shoes—it is the chain reaction of force and counter-force that can consume our treasure.

At the rate we are moving, I can see ahead only two ultimate destinations: military safety at the price of economic disaster or economic safety at the price of military disaster.

But I must say still more. As the budget expands, our liberties will contract. Each added billion will bring added intervention in our private lives. We will be pushed toward more centralization, more restraints, more official secrecy, more dossiers on our personal affairs. Labor's right to strike will be questioned. The businessman's right to act will become the government's right to direct. The hand of controllers will fall more and more heavily upon each of us.

Yet it is no man's hunger for power that can eat away our freedom—it is the inexorable cost of matching Stalin gun for gun and shell for shell over and over and over.

What shall we do? Will the dark genius of Stalin force us either to stretch our economy out of its sockets or else to chop the feet and head off our security? I am addressing the Senate today because I think the answer is *no*. I have what I sincerely believe is a message of hope.

A coming revolution in military firepower points the way out. It points to a revolution in deterring power. It can bring us peace power at bearable cost.

There was a time when some doubted that the atom could long keep Stalin from marching. There was a time when we saw the atomic bomb as something to be jealously hoarded—to be doled out in reprisal with utmost frugality against targets of unique importance—and to be conducted like a golden fleece into the depths of enemy space. All that is changing. We may increasingly look upon the atomic bomb as capable of being produced on a big scale.

Consider the rain of bombs that fell upon Germany across the six-year span of World War II. Consider the delivery of equal havoc in the span of a single day—and you begin to sense the dimensions of the coming revolution in deterring power. Would an aggressor dare bring upon himself such awful retribution?

But there is more. An aggressor not only has war plants and munitions factories far behind the battlelines—he has attacking troops and forward bases as well. With atomic weapons no longer in short supply, they need not be rationed for use solely against the aggressor's industrial vitals—they can be equally directed against his armed spearheads.

I would be surprised if any Senators except members of the Joint Committee on Atomic Energy are aware of this startling fact: dollar for dollar, atomic deterring power is actually hundreds of times cheaper than TNT. An atomic weapon can produce, at a cost of twenty or thirty dollars, the same explosive force which costs literally thousands of dollars to produce by ordinary means. Money spent upon the atomic bomb could pulverize a

"I urge that we spend five billion dollars per year upon atomic energy over and above what we currently spend—or a total of at least six billions annually."

"I am here to report to the Senate and to the American people that the atomic bottlenecks are being broken. The day is coming when the quantity of atomic weapons we are capable of making could be sufficient, beyond any question, to serve as the paramount instrument of victory. There is virtually no limit and no limiting factor upon the number of A-bombs which the United States can manufacture, given time and given a decision to proceed all-out."

dozen enemy war plants at no more expense than destroying a single plant with TNT—and this says nothing of the fact that one plane can deliver one A-bomb as against the huge armadas needed to deliver an equivalent cargo of block-busters.

I would be equally surprised if any Senators, except my colleagues on the Joint Committee, have pondered this fundamental fact: since the Second World War came to an end, only three cents in the military dollar has been allotted to atomic bombs. In other words, less than one-thirtieth of our total defense money goes to produce the free world's supreme deterrent.

If three cents for this weapon and ninety-seven cents for all other weapons strikes you as topsy-turvy, let me say there were once good reasons for it. There were bottlenecks in raw materials, bottlenecks in equipment and technical progress, and—yes—bottlenecks in thinking.

Some people used to claim that A-bombs numbered in thousands or tens of thousands were beyond our reach. They insisted that the atomic weapon, although fearful and staggering, could never be decisive in winning a war or preventing it.

I am here to report to the Senate and to the American people that the atomic bottlenecks are being broken. The day is coming when the quantity of atomic weapons we are capable of making could be sufficient, beyond any question, to serve as the paramount instrument of victory. There is virtually no limit and no limiting factor upon the number of A-bombs which the United States can manufacture, given time and given a decision to proceed all-out.

If we mass-produce this weapon, as we can, I solemnly say to you that the cost of a single atomic bomb will become less than the cost of a single tank.

If your purpose, Mr. President, is to deter an aggressor, which would you rather have at the same price—a tank or an atomic bomb? If your purpose is to avert war while you wage peace, which would you choose—an everyday howitzer or an atomic artillery piece? If you were Stalin plotting an aggressive attack, which would you most fear—a plane loaded with TNT or a plane loaded with atomic explosives?

The simple arithmetic of strategy dictates that we concentrate upon *real* fire-power—*real* deterring power. The simple arithmetic of economics equally dictates that we emphasize the new and cheap TNT—atomic TNT. Of course we will still want conventional weapons regardless of their high cost. But first things must come first.

ATOMIC WEAPONS FOR LAND, SEA, AND AIR

I therefore propose that we now get about the business of building up our atomic bone and muscle and cutting away what will become excess military fat. Specifically, I propose that we make our best and cheapest weapon—the atomic weapon—the real backbone of our peace power.

I propose an atomic army and an atomic navy and an atomic air force—in place of the conventional defenses we now maintain to the tune of fifty or sixty billion dollars a year.

Here is what I mean by an atomic army: fewer foot soldiers armed with rifles and more specialists equipped to fire an atomic shell wherever the enemy masses his troops. Fewer mortars and more short-range guided missiles with atomic warheads. Fewer flame-throwers and more radiological warfare. I have in mind air-ground teamwork, with light planes capable of hurling atomic weapons at enemy troops, supply dumps, and transportation choke points.

"If we mass-produce this weapon, as we can, I solemnly say to you that the cost of a single atomic bomb will become less than the cost of a single tank."

And here is my conception of an atomic navy: nuclear-powered submarines almost unlimited in range; nuclear-powered aircraft carriers capable of launching planes which carry the atomic bomb on both strategic and tactical missions; ship-based atomic artillery; ship-based guided missiles with atomic warheads; atomic mines; and target-seeking torpedoes which deliver atomic explosives.

An atomic air force, for its part, will seek out and destroy, with atomic weapons, the enemy's industrial sinews of war. It will fire missiles with atomic payloads. It will deliver the hydrogen bomb when that most terrible of weapons is achieved. Even more, it will visit atomic fury upon the very airfields and bases from which an aggressor would strike against our cities.

ULTIMATE ECONOMY

In all logic and common sense, an atomic army and an atomic navy and an atomic air force ought to mean fewer men under arms. They ought to mean a major reduction in the tens of billions we would otherwise spend upon stacks and stacks of conventional armaments. They ought to mean a sluffing off of outmoded operations and outdated expenses.

Let me cite an example of what I mean. Last fiscal year we paid out of the United States Treasury about four-fifths of a billion for atomic weapons. We also paid out five times this amount—or more than four billions—for small arms, bullets, incendiaries, hand grenades, and the like. I assert we should work toward turning this ratio upside down. I assert that we can buy far more security at far less over-all cost by spending the four billions upon atomic weapons and the fraction of a billion upon small arms and hand grenades.

Here is the way we can save thirty to forty billions of the sixty to eighty billions per year that otherwise threaten to become the price of survival.

For every dollar spent upon atomic defense we can save five dollars on conventional defense.

The first important savings can come next year.

NOT A "ONE WEAPON" THEORY

There are those who warn against a one-weapon theory of war. I agree. That is why I call for a sweeping variety of atomic weapons—one model that takes the place of a thousand bazookas, another that makes unnecessary a hundred depth charges, yet another

that would substitute for TNT stacked as high as Pike's Peak.

There are those who warn against viewing the atom as a magic weapon. Again I agree. That is why I advocate making it in overwhelming quantities—just as we would mass-produce a superb conventional weapon. We must have truly balanced, well-rounded, and versatile forces, with each arm equipped to exploit the atom to the utmost.

I say again that the sky is the limit on the number and variety of atomic weapons which the United States can produce—all at a cost, not of tens of billions per year, but a few billions.

RUSSIA'S ATOMIC PROJECT

Something else, unfortunately, is also without potential limit. It is the danger from Russia's atomic project. Right now—today—the Soviet rulers have the capability of attacking twenty or thirty of our cities with atomic bombs. Every tomorrow will see that capability increase.

Did you know, Mr. President, that many more people work in the Soviet atomic project than the 100,000 who work in our own? Did you know that Russia has gone after atomic weapons on a top priority basis?

Some of us refused to believe that Russia could break our atomic monopoly until many years had passed, but she did it in short order. Some of us refused to believe that Russia could build long-range bombing aircraft, but she did that, too, in short order. Some of us enjoyed telling stories about the backwardness of Soviet industry, but we now are informed that the best-designed and best-built jet fighter in action over Korea is not made in America but made in Russia.

I warn you that the Kremlin, no less than ourselves, is capable of producing atomic weapons in huge numbers, and I warn you further that this is just what the Kremlin has set about ruthlessly to accomplish.

Senators, I propose that we multiply the scope and scale of our American effort.

I urge that we spend five billion dollars per year upon atomic energy over and above what we currently spend—or a total of at least six billions annually.

I ask that we so accelerate and expand our program that Oak Ridge and Hanford and Savannah River and Paducah will come to seem hardly more than a first-rate beginning.

I say that to produce fewer atomic weapons than we are physically capable of producing is, in the present crisis, unthinkable. We now have no choice but to pour out the stuff of which bombs are made literally by the ton.

"From history we know that an unbridled arms race always leads to war—and I do not believe that the laws which govern such a race have been repealed in this atomic age."

VALUE FOR PEACE

If this does not buy us time to make peace, nothing will.

Let me also call attention to a wonderfully auspicious but little understood fact: the atomic material now in our weapon stockpile is far more valuable for peace than all the gold stored at Fort Knox. The very same material which can create a fearful explosion can likewise serve as the fuel for future peacetime industrial power reactors. Surround such material with one type of apparatus and you get a hideous destructive detonation. Surround the identical material with another type of apparatus and you get power which can turn dynamos and drive propellers and serve the welfare of mankind.

CONCURRENT RESOLUTION

Remember that the invention of gunpowder was once the spur for a whole field of chemical development that has brought untold benefits to the human race. Today's notable progress in building a nuclear-powered submarine foreshadows tomorrow's great atomic ships for trade and commerce.

The priceless material which now constitutes our atomic reserve will last thousands of years without deterioration. If we can achieve real peace, that self-same material will not be barren and wasted; it will not become obsolete and useless; and money spent creating it will not be lost. The material will loom instead as a splendid physical heritage, usable to bring a better life to all our people.

To concentrate upon atomic weapons is to build peace strength no less than war strength.

I am today introducing a concurrent resolution that embodies these conclusions. My colleagues on the Atomic Energy Committee have had before them the same facts and the same evidence which give rise to my own views. I cannot but hope that they will see fit to report out the resolution unanimously—and I likewise hope that all members of Congress who want maximum deterrence of Russia at minimum cost to the United States will equally see fit to approve it.

Mr. President, I now want to say this: I am horrified at the final implications of the atomic arms race. I shudder to think of the little packages of pent-up disaster that we call atomic bombs being multiplied and mass-produced on a staggering scale.

From history we know that an unbridled arms race always leads to war—and I do not believe that the laws which govern such a race have been repealed in this atomic age.

But mark me well: massive atomic deterring power can win us years of grace—years in which to wrench history from its present course and direct it toward the enshrinement of human brotherhood.

Six billion dollars annually spent upon atomic weapons can grant us a reprieve. It can stay the execution of war's scourge. It confers a last golden chance to reverse the final verdict.

THE RUSSIAN PEOPLE

That chance lies simply in taking the Russian people away from their rulers. It is the mute and suffering millions of ordinary Russians who constitute our secret weapon for peace. They are the ones who must fire the artillery and man the tanks and pilot the planes if their dictator is to launch aggressive war. What if they refused to carry out such orders? What if they knew that we Americans want fervently to walk with them toward peace and justice?

"As the budget expands, our liberties will contract. Each added billion will bring added intervention in our private lives. We will be pushed toward more centralization, more restraints, more official secrecy, more dossiers on our personal affairs."

"A MORAL CRUSADE FOR PEACE AND FREEDOM"

Concurrent Resolution

Sponsored by Senators Benton, Fulbright, Gillette, Hill, McMahon, Morse and Sparkman and Representatives Cole, Jackson, and others.

WHEREAS the peoples of the earth are plunged, against their will, in an accelerating armaments race that involves atomic bombs, biological and chemical agents, and conventional weapons; and

WHEREAS the prospect of the hydrogen bomb propels the peoples of the earth into danger above and beyond anything heretofore conceived by man; and

WHEREAS, in history, armaments races have always led to war; and

WHEREAS the United States is unshakeably determined to keep strong so long as its strivings to halt the armaments race through just and dependable international agreement are thwarted; and

WHEREAS United States efforts to achieve international control over all weapons do not flow from craven fear or weakness but rather from the strength of democratic institutions, faith in freedom, belief in the value and worth of the human individual everywhere, and from trust in Almighty God and His laws: Now, therefore, be it

RESOLVED BY THE SENATE (The House of Representatives concurring), That the Congress of the United States appeal to the peoples of the world to join in a great moral crusade for peace and freedom;

That the Congress of the United States advocate and recommend that the next session of the General Assembly of the United Nations devote itself to the single purpose of stopping the armaments race by speeding agreement upon effective and enforceable disarmament and control covering conventional armaments, biological and chemical agents, and atomic and hydrogen bombs;

That the Congress of the United States, as tangible evidence of its good faith, pledge itself to appropriate and to make available to the United Nations—when an effective and enforceable system of world-wide disarmament and control takes effect—a substantial portion of all money saved for a period of five years, such sums to be expended by the United Nations for peaceful development of atomic energy, technical assistance programs to underdeveloped areas, and general economic aid and assistance to all war-ravaged countries;

That the Congress of the United States call upon all other governments to make a like pledge; and, therefore,

That copies of this resolution be transmitted to the Secretary-General of the United Nations and to each United Nations delegate and also that copies be transmitted to the presiding officer of every national parliament, congress, and deliberative assembly throughout the world.

(*Continued from preceding page*)

It is almost two years ago that, here in this chamber, I proposed a fresh approach to peace. I pointed to the money we spend for sterile weapons and suggested that we offer to take this weapons money and use it, through the United Nations, to improve world living standards—provided that all other countries joined us in effectively controlling armaments and provided further that all other countries likewise contributed their weapons money to a common fund for human betterment. The example which I have cited at the time was that of spending fifty billion American dollars over a five-year period, not for bombs but for bread—always on condition that other countries and Russia in particular do exactly what we propose to do.

There were those who derided my idea as a global give-away program. They expressed amazement that I would be willing to spend as much as ten billion dollars a year, for five years, in waging peace. Today we are spending, not ten billions a year, but fifty and sixty billions a year—and we are spending it, not to raise living standards, but to raise the power of armaments toward new levels of deadliness.

Can we now afford *not* to strive all-out for peace?

WEAPONS OF PEACE

The weapons of peace lie ready at hand. They consist in penetrating Russia's iron curtain. They consist in gaining the ear of the Russian people. They consist in breaking down the unnatural barrier which the Kremlin, in fear and perversion, has erected to prevent its slaves from mingling with free men. Above all, the weapons of peace consist in capturing mankind with a great and good and magnificent idea.

Such an idea has been given us by the President of the United States, Harry S. Truman. In his greatest state address—indeed, in one of the great state addresses of all time—our President one year ago proposed to the United Nations that all countries disarm subject to fool-proof controls and that all countries use the wealth thus liberated from weapons to build a better and nobler planet.

Today, along with distinguished colleagues in the Senate and House, I am introducing a second resolution. It would place the Congress squarely behind a program of bread for bombs, peace for war, life for death.

This resolution re-affirms the convictions of its sponsors when they introduced a like proposal last session. It is the crucial half of a total plan for peace—buying time with atomic weapons, using time to win the Russian people to our side.

We need a positive program for peace spelled out in detail—a program that will capture the imagination of the world. The people of Europe, the people of Soviet Russia, the people of America, don't want war.

The earth's peoples must be told that an expanded atomic program is a reluctant alternative forced upon us by the aggressive attitude of the Kremlin, that our first desire is for peace.

The sole source of our danger lies in the fact that the Russian people may believe the lies of the Soviet government that we are plotting to destroy them. If we take away this weapon of fear from the Kremlin leaders, if the Russian people are convinced of our peaceful intentions, the Soviet government will never be able to undertake a war of aggression against us. The Soviet strategists continually denounce us as warmongers to keep their people in line.

PEACE—OUR BASIC OBJECTIVE

In expanding our atomic program, we must again remind the world that the first and basic objective of our foreign policy is peace. We must again remind the world that these hideous weapons can be stripped from the arsenals of nations just as soon as the Kremlin masters decide that they want peace instead of war.

We can be sure that the word "peace" pays terrific dividends because the Communists use it constantly. They have convinced many thousands of honest people, who should be our friends, that we are imperialists plotting aggression and war.

If the world misunderstands our motives and our purposes, it is our duty to set the record straight. I believe that the announcement of a dynamic and generous peace program by us will be the finest weapon we can use in the struggle against Communist warmongering. I believe that if we talk peace the peoples of the earth will believe us.

One place to talk peace is in the General Assembly of the United Nations, scheduled to meet next November in Paris. There let us galvanize the world through the boldness and sincerity of our insistence upon a fresh attack against the twin evils of our time—poverty and war.

Let us therefore tell the Russian people that their cause is our cause. Let us tell them even more. Let us proclaim that—if Stalin will only agree to a fool-proof plan for the curbing of armaments—we stand ready to join with all other peoples in using large portions of our defense monies in a war against want. Let us pledge that—if effective and universal disarmament is achieved—we will do our share and more to remake this embattled planet nearer the heart's desire.

"A GREAT AND AGELESS TREASURE"

Concurrent Resolution

Sponsored by Senator Brien McMahon and Representative Carl Durham, Chairman and Vice-Chairman, respectively, of the Joint Committee on Atomic Energy

WHEREAS the cost of military fire power based upon atomic bombs is hundreds of times cheaper, dollar for dollar, than conventional explosives;

WHEREAS since mid-1945, only three cents out of each American dollar paid for military defense has been spent upon atomic weapons;

Whereas present defense expansion plans still assign three cents in the military dollar to these weapons;

WHEREAS atomic energy, having already revolutionalized strategic bombardment, promises to revolutionalize tactical warfare and to play a dominant role in defending against massed surface forces;

WHEREAS a vital defense against atomic attack upon American cities is a speedy and massive atomic counter-attack upon the bases from which an aggressor strikes;

WHEREAS recent developments greatly increase the number and type of atomic weapons capable of being produced;

WHEREAS the same material which powers a bomb can also power peace-time dynamos and commercial ships and planes;

AND WHEREAS the atomic weapon is therefore the first weapon known to history which is a great and ageless treasure as precious for peace as for war;

NOW, THEREFORE, be it resolved in the Senate of the United States (The House of Representatives concurring) that it is the sense of the Congress,

That an allocation of three cents in each military dollar for our best and cheapest weapon is unreasonably and imprudently small;

That the Army, Navy, and Air Force must each be rapidly equipped with atomic weapons in far greater numbers and variety, looking toward more security for the United States at lower annual defense budgets;

AND, THEREFORE, that the United States must go all-out in atomic development and production.

At the left and at the right of the conclusion of the Senator's speech, above, are the resolutions which he submitted to the Senate. Since then he has made some modification in his proposals.

Some of the other news developments related to this speech are reported following the speech and in our regular News & Notes department

WEEKS OF HISTORY AND MYSTERY

The latter part of September and the early part of October of 1951 may be remembered by historians as the beginning of a sharp downward turn in the spiral apparently leading toward the violent vortex of an atomic war.

In rapid succession came announcements concerning atomic submarines, atomic planes, guided missiles, and increased appropriations for the hydrogen bomb.

No sooner had Americans really begun to appreciate the implications raised by Senator McMahon's speech than they were asked to digest the news that the Russians had exploded a second atomic bomb.

In an attempt to give the relatively few facts discernible through the fog of secrecy and the smoke of controversy, the Bulletin *is herewith printing in the order of their chronological appearance the news of some of the major developments of recent weeks.*

September 4

There had been rumors from Congressional committees before the Presidential statement, and one Senator had even used the word "fantastic," but talk of "strange" and "terrible" weapons did not become a subject for the nation's top headlines until President Truman's visit to San Francisco for the Japanese Peace Treaty Conference.

There he told a meeting of Democratic party leaders:

"It is fantastic what can happen with the use of the new weapons that are now under construction in this country, not only the one which we all fear the most, but . . . weapons which are fantastic in their operation. I hope we will never have to use them."

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September 13

The Air Force released photographs and announcements of "The Matador," said to be a guided missile, and the President at an afternoon press conference said it was one of the weapons he had in mind as "fantastic" when he made his San Francisco speech.

The Air Force said it was establishing its first guided missile squadron, based at Cocoa, Fla., for this jet-powered, rocket-assisted take-off projectile. Called the B-61, it has sharply swept-back wings and is described as "something like a smaller edition" of the B-51, a medium bomber built also by the Glenn L. Martin Company in Baltimore.

September 17

Adm. William Fechteler, Chief of Naval Operations, said the Navy has crews trained to launch atomic bomb attacks from carriers. He said there are two plane-types in this kind of operation, the P2V Neptune patrol bomber and the AJ attack plane.

The Defense Department announced "Exercise Desert Rock," for Army, Navy, and Air Force training in atomic warfare.

The Joint-Committee heard from K. T. Keller and Maj. Gen. K. D. Nichols, director and deputy director respectively of the guided missiles program, and "received a report on guided missiles, particularly from an atomic energy viewpoint."

———

September 17

The President asked Congress today for another $484,240,000 for the hydrogen-bomb development planned at Savannah River, Georgia. This puts requests for money for this project over the billion dollar mark. The total which has been appropriated or asked for is now $1,180,000,000.

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September 18

Senator McMahon addressed the Senate on the subject of "Atomic Weapons and the National Defense." See page 297.

THE PRESIDENT'S SECURITY ORDER

September 25

The President issued an Executive Order "to strengthen our safeguards against divulging to potential enemies information harmful to the security of the United States."

The order stated that it provided "for the first time, uniform standards for classifying and protecting security information throughout the Executive Branch of the Government. At the same time, the order prohibits the classification of any information by any agency unless it can show affirmatively that disclosure of the information would harm the national security. Therefore some agencies will never have occasion to institute classification and many of the others will have only infrequent need to do so.

"The necessity for this order arises from the fact that security information occasionally involves, and must be handled by, agencies which normally do not handle security matters. The order requires them to protect security matters in the same manner as they would be protected in one of the key defense agencies which have traditional classification systems. On the other hand, the order prohibits any agency from classifying non-security matters."

The order contained nothing very new in regard to security provisions except that it established security procedures relating to "top secret," "confidential," and "restricted" material throughout the government.

However, it was severely criticized immediately by individual newspapers and publishers on the grounds that the extended secrecy and censorship would be used as a cloak, not for real security reasons, but to keep back news which might embarrass an agency or official. It was also criticized for formalizing and extending a secrecy the press has begun to feel is already too widespread.

In a letter which went to Executive Departments from the President it was said, "It is my hope that the practical effect of these regulations will be to make more, rather than less, information about the Government available to the people. This should result from the segregation of security information from non-security information. To put the matter bluntly, these regulations are designed to keep security information away from potential enemies and must not be used to withhold non-security information or to cover up mistakes made by any official or employee of the Government."

The President also said that he ex-

pected "each Department head or his designated subordinate to investigate promptly and carefully any alleged instance of unjustified use of security classifications."

September 25

In answer to questions from reporters concerning speculations set off by Senator McMahon's speech in the Senate, Secretary of Defense Robert A. Lovett said, "There is no new, inexpensive, or magic way to win wars in the near future."

However, Secretary Lovett indicated that he was not taking issue with the Senator, insofar as he had understood McMahon's remarks. The Secretary commented, "If I understand him correctly, he was pointing the way to long-range objectives. In that respect we share many of his hopes for the future and we are working hard to make them a reality."

Lovett pointed out that "meanwhile, however, we must rely upon proved, tested, and available models to win today's battles with the men presently trained to use them."

"Fortunately," he continued, "there is enough truth in both the weapons-development stories and in the progress reports on atomic energy to encourage a very optimistic outlook for improved American armaments. However, until new weapons and new military applications of atomic energy are available for field use, our national safety in the face of attacks depends upon improved conventional weapons in ample quantity and with sufficient trained and equipped ground, naval, and air forces to use them effectively."

Secretary Lovett hastened to point out—in the light of rumors and misinterpretations on reports of 'fantastic new weapons" that "a guided missile on the drawing board or at the proving ground can't win 'Heartbreak Ridge' in Korea tomorrow morning."

October 1

Defense Secretary Robert A. Lovett and the Joint Chiefs of Staff met today with the Joint Committee on Atomic Energy to discuss an expansion program—which one committee member said would fall considerably short of the six billion-a-year program suggested by Senator McMahon.

Following the meeting Senator McMahon issued a brief statement which named the visitors from the Pentagon and said they "vigorously recommended a major expansion program."

THE USSR'S SECOND BOMB

October 3

The President's press secretary, Mr. Joseph Short, read the following statement to the White House press correspondents:

"Another atomic bomb has recently been exploded within the Soviet Union.

"In spite of Soviet pretensions that their atomic energy program is being directed exclusively toward peaceful purposes, this event confirms again that the Soviet Union is continuing to make atomic weapons.

"In accordance with the policy of the President to keep the American people informed to the fullest extent consistent with our national security, the President has directed me to make this statement and to stress again the necessity for that effective, enforceable international control of atomic energy which the United States and a large majority of the members of the United Nations support.

"Further details cannot be given without adversely affecting our national security interests."

October 3

On the same day the President announced the bomb, some Congressional testimony of Gordon Dean, Chairman of the Atomic Energy Commission, was released.

Mr. Dean had appeared before the appropriations subcommittee of the House two weeks before, and had been asked by Representative Albert Thomas (D., of Texas), whether an extra six or ten billion dollars put into atomic energy development might avert a war and save up to half of the 1952 budget.

Mr. Thomas then asked if Mr. Dean knew of any new materials by which thousands of atomic bombs could be produced. Mr. Dean said, "I hate to go into figures. . . . I would rather not talk of numbers."

Asked about Senator McMahon's comparison of the cost of a bomb to the cost of a tank, Mr. Dean said the cost of a bomb is going down but eventually would be closer the cost of "a few tanks," and he said he meant the big, expensive tanks.

Cartoon by Ciasie

"And so it is evident that the end of our civilization is at hand. Good night—and here is Lyle Van for the Pure Oil Company."

On the same day General Mark W. Clark, Chief of the Army Field Forces, told a Chicago club luncheon that "new and unconventional weapons will be flowing to the troops before too long."

He added that we have atomic weapons which "certainly" should be effective in ground combat if the high command decides to use them.

October 4

Senator Bourke B. Hickenlooper (R., Iowa), former Chairman of the Joint Congressional Committee on Atomic Energy, said that powerful new atomic weapons are available for use in Korea, that he favors using them, but that it is a military decision.

SECRECY PRESS CONFERENCE

October 4

The press was severely lectured today by the President, concerning its patriotic duty in dealing with information which could be valuable to potential enemies.

He asserted that a report to the Central Intelligence Agency had indicated that 95 per cent of the security information of the United States already had been published by American newspapers and magazines.

At one point he said that newspapers and magazines should not have published information about and photographs of the new secret weapon, "the Matador"—data released by the Department of Defense.

The press conference was one of the longest in the memory of White House correspondents, and afterwards their queries concerning the ban even on information from official sources drew this official statement from the President's secretary:

"The President has directed me to clarify his views on security information as follows:

"1. Every citizen—including officials and publishers—has a duty to protect our country.

"2. Citizens who receive military information from responsible officials qualified to judge the relationship of such information to the national security may rightfully assume that it is safe to publish the information.

"3. Citizens who receive military information from sources not having the necessary responsibilities and qualifications to evaluate such information should, as loyal Americans, exercise the most careful judgment in determining the safety of publishing such information.

"4. The recent executive order on classified information does not in any way alter the right of citizens to publish anything."

The press conference had opened with the President reading a statement elaborating on his security order of September 25. When asked what had caused this order, the President first referred to an article, "The Atom and the Businessman," published in *Fortune*, January, 1949, which the President said had the locations and maps of our atomic energy plants . . . he also mentioned air maps of Washington, New York, Chicago, San Francisco, Seattle, and other cities . . . published in newspapers in those cities.

When asked if official agencies did not give out such information, the President replied that he did not care who had given it out, publishers ought to be as patriotic as he was and *he* wouldn't give it out.

This started a discussion which ultimately led to the statement issued by the presidential secretary.

October 5

In a speech in Los Angeles Gordon Dean said there loomed ahead a new kind of atomic warfare not aimed at destruction of cities.

"In the past," he said, "most of us have thought of atomic warfare in terms of intercontinental bombers striking at the great cities and industrial hearts of an enemy nation. . . . This concept of atomic warfare, while still true, is now no longer the whole truth.

"It is but one kind of atomic warfare, and there is now a new, quite different kind . . . much more promising as a means of halting aggressors without the risk of destroying large parts of the world in the process."

He said "I think that when a situation arises where in our carefully considered judgment the use of any kind of a weapon is justified, we are now at the place where we should give serious consideration to the use of an atomic weapon provided it can be used effectively from the military standpoint and that it is no more destructive than is necessary to meet the particular situation in question."

In a passage which was interpreted in some quarters as forecasting the use of tactical atomic weapons in Korea he said, ". . . I think it leaves us in a position where we can, with complete justification, treat the tactical atom—divested of the awesome cloak of destruction which surrounds it in its strategic role—in the same manner other weapons are treated."

October 5

In an editorial, *The Christian Science Monitor* said:

"Militarily the doctrine of balanced forces is as sound as it ever was. . . .

"Similarly there is intense need for attention to an equally valid doctrine of balanced forces in the whole orbit of international relations. Arms are by no means the only factor in that sphere.

"It strongly behooves Americans to see that their national efforts in behalf of world order and understanding are at least equal to their efforts to maintain physical defenses, that their discharge of world responsibilities is such as to make their regime deserve survival, and their general attitude is such as to dispel uneasiness and invite friendship."

Paul C. Hoffman, former ECA Administrator, urged a "sustained peace offensive."

He said, "If we use our strength in an irresponsible manner—if we run out and drop a bomb casually—the result can be utter disaster. For us and for the free world, we must grow in humility as we grow in strength."

October 5

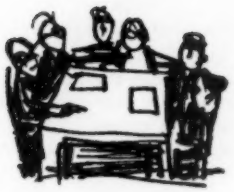
Hanson Baldwin, military commentator for the New York *Times* wrote, "The United States military services, by a ruling of the President, now have limited custody of the atomic bombs, in that the military handle the bombs for training purposes although the bombs remain under the technical custody of field representatives of the Atomic Energy Commission."

(*Continued on page 320*)

> *"Could not explosives even of the existing type be guided automatically in flying machines by wireless or other rays, without a human pilot, in ceaseless procession upon a hostile city, arsenal, camp, or dockyard?"*
>
> —WINSTON CHURCHILL,
> *Thoughts & Adventures*, 1925
> —Twenty years before the V-2

A DEAL BEFORE MIDNIGHT?

DAVID R. INGLIS and DONALD A. FLANDERS



The two preceding articles show sharply how great an influence technological change can have in the shaping of our foreign and domestic policies. The concern of scientists that members of the higher echelons of government be kept continuously informed of technological development is reflected in the proposals presented below by two scientists who worked on the Manhattan project at Los Alamos, and who are now with the Argonne National Laboratory, at Chicago.

DURING the first few years of the atomic age there has been a dimming of the early hope that international agreement might prevent the calamity of an atomic holocaust. But even as we struggle to postpone the evil day by maintaining the upper hand in the conflict between East and West, we should be making a vigorous exploration for further ideas about possible agreements.

For the unlimited growth of stockpiles is progressively adding to the difficulties of both the political *and* technical problems of atomic control.

A-BOMBS LIABILITY TO BOTH SIDES

Here in the West we have come to feel that we need the atomic bomb. It has served us well in the short period of our "monopoly." Not only did it bring the end of World War II, it is probably responsible for the freedom of Western Europe from Soviet domination today, or at least it permitted us the luxury of bringing our troops home in response to public demand while leaving a vacuum of conventional power in Europe. It further made possible military economies at a time when unusual expenditures were needed for construction and reconstruction.

Today two very different parts of the world face each other with distrust and enmity, each possessed of atomic bombs; yet for neither of them does the atomic bomb appear to hold an advantage for future plans commensurate with the dangers involved. The main aim of the Western peoples is to make their part of the world safe for their way of life, and this necessitates defense against aggression. The role of atomic weapons in this defense is chiefly the threat of retaliation. But the stability of this position is very precarious indeed. It takes only one fool in power, one jittery decision, to pull the trigger and unleash unprecedented destruction.

★ ★ ★

In the Soviet-dominated part of the world an important tenet is that Communism and Capitalism cannot coexist, so the latter must be destroyed. One might conclude that the atomic bomb would ideally serve the Soviet purpose—destroy the rest of the world and let the Soviet part of the world prosper alone, even if it must rise from the ashes to do it.

But the Soviet leaders are probably not that ruthless. They doubtless aspire to dominate a world that is more nearly intact. Thus they might use atomic weapons in a war of nerves, in which they would hope that the iron nerves of the few in the Kremlin would triumph over the timidity of the many in the despised and divided Capitalist countries. The growing strength and unity of the Western nations may well convince the Soviet leaders that this course will accomplish little except to keep the world sitting on a powder keg, with the grave risk that the powder will be ignited, thus destroying the prize they seek.

LACK OF LONG-TERM POLICY

The rejection of the Baruch plan and the frustration arising from Soviet political methods have given us a feeling that there is little hope of avoiding an eventual atomic world war. Needled by aggression in Korea and elsewhere we are proceeding with a show of confidence to try to postpone the threat of atomic war and to prepare ourselves, at least psychologically, to survive it as some sort of society if it comes.

Sometimes it would seem that the seriousness of the situation was being belittled, in that we are being told under brave titles how to survive atomic attack—essentially by being lucky enough to be far away from where the bombs hit. Nevertheless this may help steady our nerves against future Soviet rattling of the sword. More significantly, we are attempting to unify the free world, preparing it for non-atomic resistance to non-atomic aggression and stepping up our atomic program.

Our over-all policy seems to be to devote the remaining time within which we may be supposed to have a clear superiority in atomic armaments to building up within the Western powers military forces better able to cope with the more conventional types of forces in which the Soviets may be assumed to have superiority.

We hope that when this object has been achieved the Soviets will find it to their interest to make and keep agreements. In the domain of atomic energy, however, we seem to have no plans, except possibly to re-offer the proposals already made, for the acceptance of which our main reliance would seem to lie in the the possibility of internal change within the Soviet Union. The effectiveness of terrorist government discourages the hope of a popular uprising. It seems unlikely also that there will be a softening of Soviet foreign policy as a result of Stalin's death. There may be a palace revolution, but there do not seem to be the makings of a tolerant government within the present Politburo. The chief hope would seem to lie in a

gradual mellowing of the Soviet government with growing maturity. This is quite conceivable in the course of a half-century or so, if the atomic crisis can be held off that long.

ATOMIC CONTROL INCREASINGLY DIFFICULT

The overwhelming weakness of this policy arises from the fact that atomic energy becomes increasingly difficult to bring under control as time passes. No matter what sort of control scheme is devised, it is going to have to provide some assurance to each side that the other is not concealing a stockpile of atomic explosives. Near the beginning of the atomic age, before there had been much time for the few existing plants to produce much fissionable material, this would have been relatively easy, although even then unhampered access to and inspection of the production plants would have been necessary. This was the principal concern of the Acheson-Lilienthal report.

But now that production has been underway on both sides for some time there is the added problem of estimating total past production. Clearly this can only be done with limited accuracy, which we might assume to be represented by some fixed percentage of the total past production. This means that when the total stockpile of either side is so large that it would be possible to conceal an amount sufficient to have a decisive or important effect in a war, it may no longer be possible to initiate a control scheme. For it would then be practically impossible to write a disarmament treaty that would not require at least one side to take an enormous risk that the other side might be preparing an effective surprise attack.

Thus there is at some time, perhaps in the fairly near future, a point of no return beyond which the world will be doomed to the threat of atomic war until that war takes place, unless by some political freak one side is able to gain the adherence of the other without the use of atomic weapons.

POSSIBILITY OF LIMITED INTERIM CONTROL SCHEMES

An ideal atomic control scheme would eliminate competing stockpiles entirely, as the Baruch proposal aimed to do. Now that competing stockpiles exist it may be too late to seek such an ideal solution except as the result of a long evolution. A first step in that direction might be an agreement that tolerates the existence of opposing stockpiles limited to a size well below saturation. The situation would still be dangerous, but less so than with unlimitedly increasing stockpiles.

Today's is an especially distrustful world, and no atomic control scheme is worth discussing that will not operate in spite of mutual distrust. Under these circumstances the possession of fissionable materials by both sides rather than by just one may be advantageous in initiating an agreement. There is serious uncertainty in the ratio 0/0. But if the sizes of the opposing stockpiles are not too disparate (and do not greatly exceed the ultimate saturation), there may be less danger to either side if an agreement is made that permits each side to keep a declared amount in comparison with which the error in estimation of the actual amount is not decisive. Thus it seems that serious consideration should be given to the technical and political feasibility of such an approach, among others.

TEMPORARY FAVORABLE SITUATION

In this connection there is another factor that would seem to be favorable to success in spite of past failure. Whether an agreement to limit atomic armaments is to be reached independently of agreements on conventional weapons or not, considerations of the latter must certainly enter into negotiations on the former. Thus the re-arming of the West may for a time contribute to the possibility of reaching agreement, since atomic armaments will no longer be regarded as our sole defense.

Even this relatively favorable situation may last for only a few years if, in spite of the general technical considerations concerning the critical mass required for a chain reaction, the future tactical uses of atomic field weapons may be as important as suggested by the remarks of Senator Brien MacMahon, which appear elsewhere in this issue.

Our experience since the close of World War II has shown us the difficulties of obtaining Soviet adherence to agreements in situations where we were unable to enforce compliance. The atomic control problem is so tough that we should now be vigorously attempting to formulate the nature of the agreement we shall seek when we shall have had some success in our policy of creating a situation in which the Soviets will make and keep agreements. *The effort expended in strengthening our arms is enormous. We should not stint the effort needed to define our aims.*

INTENSIVVE SEARCH FOR IDEAS NEEDED

The prospect of atomic destruction is indeed much too grim to permit us to stop negotiating, or even to stop thinking about the problem, after trying with only one scheme. Though the aims of that scheme were about the best that we could reasonably strive for, there are other less far-reaching aims which, if achieved, would greatly reduce the threat. Perhaps the minimum aim worth striving for is to limit the growth of stockpiles to a point well below saturation, which would have the two-fold effect of keeping the temptation for atomic surprise attack within bounds and of maintaining the possibility of eventually establishing fully effective control.

It is perhaps natural for the man in the street to think that our government has all these matters under adequate consideration, so that he need not worry about them. But the past failures of governments to anticipate their needs provide precedents that lead one to suspect that not all stones have been left unturned. We may assume that the President and Secretary of State are giving serious attention to the problem, but we must remember that they are intensely pre-occupied with a great variety of other problems.

Their position in diplomacy is like that of a commanding general in the military field. It is well known that in World War II generals and admirals and their staffs, who were pre-occupied with specific problems, received inestimable aid from "operations research" teams. These were semi-independent groups of technically trained workers who studied the over-all technical problems within the framework of their combat applications, and in some cases achieved astounding success by revolutionizing the use of weapons. In similar fashion in the diplomatic field the President and his staff should be supplied with creative ideas by a special group of imaginative thinkers dedicated to the single problem of atomic control in its relation to our whole diplomacy.

(*Continued on page 317*)

URBAN DISPERSAL AND DEFENSE

AMOS H. HAWLEY

Dr. Hawley, sociologist with the University of Michigan, discusses the practicalities of building new cities or reducing old ones to a size of about 50,000 population. Using this as a rough yardstick of "dispersion," he gives some admittedly crude estimates of the costs of such a program, for example, $35 billion would have to be spent on new housing in relocating 25 million people out of sixteen major cities. He concludes "barring the possibility of coercion from without," the municipal governmental integration required for such vast movements of population seems to be in "the remote future."

THE dispersal of urban population as a defense measure against the threat of atomic attack has been widely recommended. In view of the wide damage radius of an atomic explosion, on the one hand, and of the extent of urban concentration, on the other hand, the recommendation would seem to be a reasonable one. Moreover, it is in accord with at least one aspect of the trend of population and industrial movement that has been developing for some time, particularly since 1920. This is not to say, however, that the proposal lacks serious difficulties of execution. On the contrary, urban dispersal on a scale that would provide effective defense against bombing attacks would constitute an enormous and complicated undertaking. Obviously, a penetrating exploration of the matter is essential before any steps are taken. This paper is a preliminary effort to that end. Its purpose is to examine the meaning of urban dispersal and to attempt an appraisal of its feasibility.

First, clarification of a few definitions and assumptions is necessary. The term "urban" is subject to various uses, a range of variation that has increased considerably with the improvement of technology. Whereas in the nineteenth cenutry it was possible to use "urban" and "city" more or less synonymously, inasmuch as a city's influence ended rather abruptly at or near its legal boundaries, it is not possible to do so in the twentieth century. The great improvements that have occurred in short distance transportation and communication, such as rapid transit lines, the automobile, the telephone, and more recently television, have so extended the radius of daily movement and communication that a city's influence is carried far out into its surrounding area. The population scattered over such an area, some of which occupies lesser cities and some of which resides in open country, enters into an elaborate local division of labor which binds it together as a distinguishable unit. In other words, rather than a single city as such, the significant urban unit in the contemporary period is a constellation of cities gathered about a large central city together with the interstitial unincorporated area. Metropolitan community is the name used to denote that extended pattern of local interdependences.

It is assumed that the metropolitan community, far from being a fortuitous unit, is the pattern of urban organization required by present-day technology and economy. That is, the service functions, including administration, technical expertness, financing, transportation, communication, retailing, wholesaling, etc., essential both to mechanized commercial agriculture and to mass-producing mechanical industry can only be supplied in a large urban community. At the same time, the efficiency of local transportation and communication permits the large aggregate to disperse itself over a relatively extensive area limited only by the degree of accessibility needed among the parts.

The point is, then, that a program of urban dispersal must be confined within metropolitan community boundaries. Any measure that would result in a breaking up of metropolitan communities, for example, a uniform distribution of population over the land area of the United States, may also involve a reconstruction of the entire economy. Metropolitan community boundaries are subject to change, for they are identified solely by functional orientation toward a given center. But that they may be extended so far as to fade into meaninglessness seems improbable at least in the near future.

Although metropolitan community boundaries are functionally determined, data for their delineation are not available in published sources. Hence, an arbitrary radius of 35 miles will be assumed, for the purposes of this discussion, to measure the scope of the metropolitan community. This expedient is not without justification. About 99 per cent of the commuter traffic to metropolitan centers originates within a 35-mile radius. It also embraces most of the manufacturing activity that is clustered about central cities. And most of the inter-institutional relations involving the central city are found within the 35-mile radius.[1]

The dispersal of urban population may thus be interpreted to mean the redistribution of large urban aggregates over their respective metropolitan areas, that is, areas with radii of 35 miles. No reduction in the sizes of metropolitan areas is contemplated in this interpretation of dispersal.

[1] This position is taken also in the industrial dispersal policy formulated by the NSRB and the Munitions Board and issued as an executive order to all government agencies by President Truman on August 10, 1951. According to the recommendations made, industrial dispersal is to be held within existing "marketing" areas, i.e., to within distances of 10 to 20 miles from present industrial concentrations.

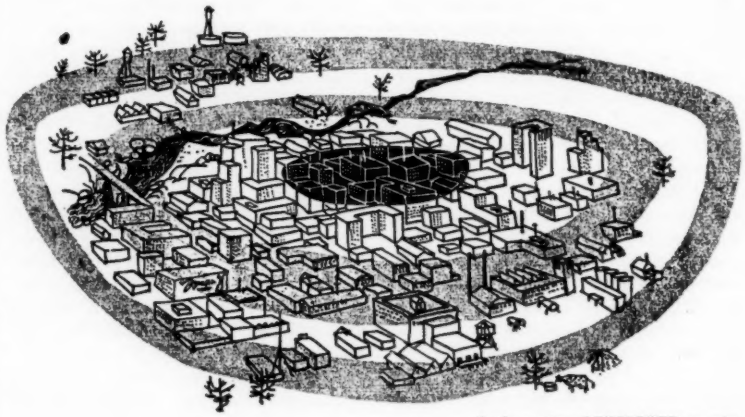
But what are large urban aggregates? A large urban aggregate may be defined as any concentration of population that exceeds an optimum size. Unfortunately, the optimum as applied to city size is a highly elusive quality. In fact, there may be no demonstrable optimum size. Most measures of life's amenities, longevity being the principal exception, vary directly with size of city. Nevertheless, many city planners argue that the most satisfactory living conditions are to be had in cities of about 50,000 population. While that figure seems to be based on the personal preferences of a few individuals rather than on controlled observation, the planners may be taken at their word and the population of all places over 50,000 may be counted in a dispersal program.

But it would seem unwise to distribute the "excess-over-50,000" population evenly over the remainder of the metropolitan areas. That would be to sacrifice many of the economies of concentration. Furthermore, if the city planners' presumption that an aggregate of 50,000 approximates an optimum size is correct, the policy should be to create as many such places as possible. There are other reasons for adopting this position. An existing city has equipment, service facilities, a shopping center, and an administrative organization. Hence, even though these may not satisfy standards of good design, a city in being is probably better able to accommodate large increments of population and construction, especially under emergency conditions, than is open country area. The stresses and strains produced by abrupt expansion, of course, would vary more or less directly with the sizes of the increments involved or inversely with the initial size of the satellite city.

Population redistribution, then, would have to be accompanied by a dispersion of service facilities and employment opportunities. Each city of 50,000 population should be developed as a relatively self-contained unit—a term that is used advisedly—at least so far as daily services are concerned. Each city would also have assigned to it a sufficient amount of industry to employ its industrial labor force. That allocation, however, should be based upon a very careful study of location costs in each urban site for each type of industry. It is not at all unlikely that some sections of any given metropolitan area would be found totally lacking in locational advantages for some industry. Attention would have to be given to matching industry to the occupational skills of the local population. Industrial differentials in wages, seasonality, and competitive position would introduce added problems into the planning for redistribution. There is no reason to suppose, however, that each population cluster would confine its movements to the immediate locale. Job changes, competition between merchants in neighboring cities, and the pursuit of a variety of interests would diffuse its activities widely over the metropolitan area.

The supply of essential utilities—water, gas, electricity, and sewage disposal—presents another problem. It would be neither economical nor wise from the standpoint of defense to attempt to supply utilities from a single source. Utility supply sources should be duplicated at intervals over the metropolitan area, each source serving a cluster of three or four cities. A complete standardization of equipment would be highly desirable, however, in order to make possible connections with systems in adjoining service areas in the event that an installation is damaged by bombing. Building for that eventuality means increased per capita costs for utilities. Water treatment plants, power plants, sewage disposal facilities, and gas storage and processing equipment would have to be built with large stand-by capacities. Larger gauge water mains and sewer trunk lines and heavier power cables would be required.

Centralization could not be completely abandoned, however, in a program of dispersion. The role of the central city as the locus of a number of integrating functions is of vital importance to the maintenance of metropolitan organization. Too often the terms concentration and centralization, which denote different phenomena, are confused. For example, although population and many of the goods-handling activities have been moving centrifugally, or deconcentrating, within metropolitan areas, the centralization of control and related functions is continuing. There is no reason to believe, in other words, that centralization as such is obsolescent. Administrative functions, specialized professional services of all kinds, wholesaling, communication agencies, the retailing of highly selected and fashion-infected merchandise, and forms of entertainment requiring unusually large capital outlays may be expected to cling about a point of maximum accessibility.



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If this is true, can all of the necessary central functions be sustained in a city of 50,000 population surrounded by a population of several millions spread over 2,400 to 3,000 square miles? The answer is probably yes, provided that adequate transportation to the central city from all parts of the metropolitan area be created. That calls for numerous radial limited-access thoroughfares and public rapid transit lines with enough belt-type highways and mass carriers to serve all zones of the total area, for the largest part of the gainfully employed, as well as most of the clientele of the central city, would have to live outside its limits.

The alternative to the preservation of centralization of the more specialized services would be to scatter them widely over the metropolitan area so that at no time of the day would a

TABLE 1

POPULATION REDISTRIBUTION IN SIXTEEN METROPOLITAN AREAS ASSUMING NO CITY LARGER THAN 50,000 POPULATION

Metropolitan area and size of city	Number of cities	1940 population	Population to be contained (at 50,000 per city)	Population to be relocated (assuming 50,000 max.)	Per cent change
New York metropolitan area	174	11,494,492	11,494,492	.....	0
50,000 and over[a]	13	8,965,105	650,000	−8,315,105	− 92.7
25,000–50,000	17	597,430	850,000	252,570	42.3
15,000–25,000	20	381,689	1,000,000	618,311	162.0
10,000–15,000	23	282,997	1,150,000	867,003	306.4
5,000–10,000	55	378,895	2,750,000	2,371,105	625.8
2,500– 5,000	46	167,817	2,300,000	2,132,183	1270.5
rural area	..	720,550	2,794,492	2,073,933	−297.8
Other four metropolitan areas with central cities of 1,000,000 or more	217	12,990,571	12,990,571	.....	0
50,000 and over[a]	20	9,685,468	1,000,000	−8,685,468	− 89.7
25,000–50,000	16	540,902	800,000	259,098	47.9
15,000–25,000	15	278,158	750,000	471,842	169.6
10,000–15,000	36	448,711	1,800,000	1,351,289	301.1
5,000–10,000	56	405,723	2,800,000	2,394,277	590.1
2,500– 5,000	74	274,041	3,700,000	3,425,959	1250.2
rural area	..	1,357,568	2,140,571	783,003	− 57.6
Metropolitan areas with central cities 500,000–1,000,000	286	14,558,234	14,558,234	.....	0
50,000 and over[a]	27	9,028,004	1,350,000	−7,678,004	− 85.0
25,000–50,000	21	738,000	1,050,000	312,000	41.5
15,000–25,000	46	870,734	2,300,000	1,429,266	164.2
10,000–15,000	38	454,444	1,900,000	1,445,556	318.1
5,000–10,000	75	529,756	3,750,000	3,220,244	607.9
2,500– 5,000	79	279,273	1,550,211	1,270,938	−455.1
rural area	..	2,658,023	2,658,023	.....	0

[a] Includes central cities.

large concentration of population occur. But several disadvantages would promptly appear in such an arrangement. The loss of accessibility to all parts of the area would interfere seriously with the operation of integrating functions. Eccentric locations would result in population living near the opposite peripheries having to travel 50 to 70 miles, instead of 35 miles, in order to avail themselves of special services. That would not be feasible. A dispersed distribution of central city functions would argue for an area with a maximum radius of 17.5 miles. Population density, therefore, would have to be four times as great as in an area with a central city.

Before proceeding further it is necessary to know something of the volume of redistribution that would be involved. For illustration, the assumptions that have been outlined will be applied to sixteen of the largest metropolitan communities in the United States. Because more recent data are not yet available in appropriate form, the estimates that follow are based on 1940 data.

New York, though it may not offer the most important military target in the country, is the largest and most exposed metropolitan agglomeration and therefore would probably be given high priority in a national program of dispersion. Approximately 11,500,000 people resided in 1940 within 35 miles of the city hall in New York City, 94 per cent of whom lived in 174 cities of 2,500 or more population. Over three-quarters of the metropolitan population, or roughly 9,000,000, occupied 13 cities of over 50,000. This is the part of the population that would require redistribution. Proceeding in simple arithmetical terms, we find that the 13 large cities could each retain 50,000 residents, leaving 8,315,000 to be resettled elsewhere. If these are removed to other cities in the metropolitan area having 2,500 or more population, bringing each city's size up to the 50,000 maximum, the results would be as shown in the first panel of Table 1. Actually 179 cities of an even 50,000 population are needed to accommodate the 8,965,105 living in cities above that size in 1940. But the New York metropolitan area had only 174 cities, and since those were already occupied in varying degrees, they could only absorb 6,241,172 new residents. The remainder, 2,073,933, would either require the creation of forty-one new cities of 50,000 population, or it could be distributed over the interstitial rural area.

The other four metropolitan communities with central cities of 1,000,000 or more population (Chicago, Philadelphia, Los Angeles, and Detroit) would involve a redistribution of about the same relative magnitude as that in the New York area, as indicated in the second panel of Table 1. Of the 9,685,468 population in cities over fifty thousand, 7,902,465 could be accommodated in the 217 cities of 2,500 or more population. Hence 783,003 would be left to be scattered over rural areas or to be housed in sixteen new cities of the "optimum" size.

In metropolitan communities with central cities of 500,000 to 1,000,000 population[2] the density of population is not so great, and the available space into which population may be dispersed is more abundant than in the larger metropolitan communities. The 286 cities could absorb all of the urban population at the 50,000 size level; in fact, only twenty-one of the seventy-nine cities with 2,500 to 5,000 population would need to be increased to 50,000. Nevertheless, the absolute volume of redistribution required, which may be observed in the third panel of Table 1, would be just as large as in the other two classes of metropolitan communities.

Of course, an effective dispersion of population within metropolitan communities would be a much more complicated undertaking than has been indicated thus far. For example, no attention has been given to the distribution of cities. Little would be gained by population dispersion to small cities if the present location pattern of cities were allowed to remain. Satellite cities are concentrated near metropolitan centers and their num-

[2] The eleven metropolitan communities included in this class are: Baltimore, Boston, Buffalo, Cleveland, Kansas City, Mo., Kansas City, Kan., Milwaukee, Minneapolis-St. Paul, Pittsburgh, St. Louis, San Francisco, and Washington, D.C.

bers diminish with distance from central cities. This is to be noted in column one of Table 2. A sound policy would require the evacuation of the cities in the inner zones and the construction of replacement cities in the outer zones of metropolitan areas.

The average area contained in satellite cities between 40,000 and 60,000 population in 1940 was approximately twelve square miles. Since cities of that size have 20 to 30 per cent of their area vacant, twelve square miles are probably adequate for most purposes, including redevelopment with a more open type of layout than they now have.

Now if the total metropolitan area in each size class is divided by the number of cities required to accommodate the urban population on the basis of the dispersion proposed, it is found that the average square miles per city in the New York area would be 11.2, in the four other large areas it would be 44, and in the eleven smaller areas it would be 148. With 11.2 square miles per city the New York area could contain the required 220 cities, but there would be no intervening or unincorporated area. In fact, the 720,559 people living in rural areas in 1940 would find themselves engulfed by cities, and the average size of cities would necessarily rise above 50,000. With 44 square miles per city, as in the Chicago, Philadelphia, Los Angeles, and Detroit areas, cities would be 7.5 miles apart at their centers, or 3.5 miles apart at their peripheries. Whereas it would be impossible to miss a city with a bomb dropped over the New York area, cities in the other four large metropolitan areas would have almost three chances in four of being missed. In the smaller metropolitan areas, the 148 square miles per city would permit a comparatively wide spacing. Cities would be 13.8 miles apart at their centers and 9.8 miles apart at their peripheries. On this basis the chances of escaping a hit by a bomb dropped over the area would be slightly better than eleven out of twelve.

Using the average square miles per city as divisors under the number of square miles in each distance zone (column two of Table 2)[3] in the respective metropolitan areas, the extent of city relocation that would be required is as shown in columns three and four of Table 2. It is apparent that

sharp reductions in the number of cities within 20 miles of present central cities would be necessary. At the same time, large numbers of new cities would have to be built from the ground up in the space beyond twenty miles from central cities.

The costs of dispersion for the sixteen illustrative areas would be enormous. Very crude estimates of some of the costs are shown in Table 3. The figures given there are based on approximate 1940 values and are designed to err on the conservative side. They are intended to be nothing more than a rough indication of the magnitudes involved.

To relocate 25.5 million people would necessitate the construction of over seven million dwelling units. Assuming the dwelling units cost at 5,000 dollars each, about 35 billion dollars would have to be spent on new housing. In addition, 280 new cities would be required. Using a figure of 30 million dollars as the 1940 value of urban publicly financed facilities in a city of 50,000 population, including equipment for water, sewage disposal, police, fire protection, schools, streets, street maintenance, parking, etc., an outlay of another 8.4 billion dollars would be spent on the new cities. Mass construction, however, would reduce the actual costs of both housing and municipal equipment below a cost figured on the usual piecemeal construction practices that have prevailed to date. The lower population densities in cities and extensive use of highway by-passes would permit narrower streets in cities and hence some additional savings of capital outlay.

The redistribution of industrial establishments located in existing large cities and the construction of shopping centers in the new cities would entail a capital expenditure of approximately seventeen billion dollars. This does not include the costs of relocating many other industrial plants that are too thickly clustered in outlying zones and small cities.

Dispersion would require also a

TABLE 2

REDISTRIBUTION OF CITIES REQUIRED FOR UNIFORM SPREAD OVER METROPOLITAN AREAS

Metropolitan area and distance from center of central city	Number of cities in zone, 1940 (1)	Estimated square miles of land in each zone (2)	Cities per zone, assuming ave. area per city[a] (3)	Change in city distribution (4)
New York metropolitan area	174	2,455	220	....
0–10 miles	34	402	35	+ 1
10–15 miles	30	169	15	− 15
15–20 miles	46	329	29	− 17
20–25 miles	23	426	38	+ 15
25–30 miles	22	516	46	+ 24
30–35 miles	19	613	55	+ 36
Other metropolitan areas with central cities of 1,000,000 or more population	217	10,336	233	....
0–10 miles	67	935	21	− 46
10–15 miles	56	1,048	24	− 32
15–20 miles	35	1,460	33	− 2
20–25 miles	24	1,889	43	+ 19
25–30 miles	20	2,288	51	+ 31
30–35 miles	15	2,716	61	+ 46
Metropolitan areas with central cities of 500,000 to 1,000,000 population	228[b]	33,824	228	....
0–10 miles	111	2,690	18	− 93
10–15 miles	38	3,349	23	− 15
15–20 miles	24	4,776	32	+ 8
20–25 miles	20	6,248	42	+ 22
25–30 miles	22	7,654	52	+ 30
30–35 miles	13	9,107	61	+ 48

[a] New York area: 11.2 sq. mi.; other large areas: 44 sq. mi.; small areas: 148 sq. mi.

[b] Required number of cities used instead of actual number; fifty-eight cities of 2,500–5,000 omitted.

[3] The amounts are less than would be found in full circles because of the locations of most of the central cities on or near large bodies of water.

new road system in each metropolitan area. Perhaps a few existing roads could be incorporated into the new system, but most of the present road mileage would prove either inadequate or improperly located. If a web-like system were to be constructed with radial thoroughfares at 20 degree intervals, each alternate one a limited-access route, intersected at five-mile intervals by concentric highways, the number of miles of road surface needed in each area would range from 750 to 1,500, depending on how close to a major body of water the center was situated. At 100,000 dollars per mile, the construction of road systems of this kind in all areas would cost about 16 billion dollars. It is worth noting that metropolitan areas with comparatively small populations would need the same amount and type of road mileage as the more densely settled areas, consequently the proportion of all costs attributable to roads would be larger.

The 220 cities to be abandoned, which include most of the largest cities, represent an investment that would have to be written off. Even if full weight were given to depreciation that has already occurred, an amount equal to 8.8 billion dollars is an extremely modest estimate of the cost of abandonment. Another similar cost would arise from the desertion of the privately owned real property in the 220 cities. A loss of some 53 billion dollars would be incurred in this manner. Although that figure includes a value for land as well as for buildings, the conversion of the land to a low intensity use would eliminate much of its book value. It may be objected that losses resulting from abandonment are not real costs since they involve no expenditure of materials or labor. On the contrary, the properties represent a past expenditure of materials and labor, the use value of which has not been fully extracted. Someone would have to absorb the value loss. A very important policy question is who should pay for such a loss, government or the individual owner.

The total estimated cost of the dispersal program in the sixteen largest metropolitan areas, therefore, would amount to 139 billion dollars. That is a minimum, in fact, a partial, figure. It does not include the costs of moving churches and other tax-exempt institutions, of reconstructing rail lines and switching yards, of constructing new outdoor recreational facilities, and of relocating farms. Nor does it include any item for the expansion of the municipal facilities in small cities that would have their populations increased to 50,000. The final figure in uninflated dollars would doubtlessly rise to 200 billion dollars, an amount equal to about two and one-half times the total national income of 1940. And it should be remembered that this estimate applies only to sixteen metropolitan areas.

TABLE 3

ESTIMATED COSTS OF REDISTRIBUTION IN SIXTEEN METROPOLITAN AREAS

Item	Total	New York metropolitan area	Other metropolitan areas with central cities of over 1,000,000 population	Metropolitan areas with central cities 500,000 to 1,000,000 population
Physical facilities				
New housing units	7,059,960	2,446,000	2,482,000	2,133,000
New cities	280	76	96	108
New roads, miles	15,729	749	3,745	11,235
Cities abandoned	220	32	80	108
Estimated cost (000's omitted)				
New housing units	$ 35,305,000	$12,230,000	$12,410,000	$10,665,000
New cities	8,400,000	2,280,000	2,880,000	3,240,000
Industrial and commercial plant	17,200,000	10,000,000	3,200,000	4,000,000
Roads	15,900,000	800,000	3,800,000	11,300,000
Cities abandoned	8,771,000	2,250,000	3,281,000	3,240,000
Assessed valuation lost	53,147,000	31,470,000	9,853,000	11,824,000
Total cost	$138,723	$59,030,000	$35,424,000	$44,269,000

Whether the construction industry could accomplish a task of this size in short of ten years is doubtful. It is even more doubtful that such a program could be carried on simultaneously with military mobilization at its present rate. Certainly, unless it were spread over a ten, fifteen, or twenty year period, dispersion would so disrupt the organization of the metropolitan community that it would be unable to function above a very low level of efficiency. But would ten, fifteen, or twenty years be soon enough to meet the threat of atomic warfare?

The impact of dispersion on the social structure of the community, though less subject to measurement, would be no less serious than that falling upon the physical structure. Social structure, considered for the moment as something distinguishable from the economy and comprised of churches, clubs, families and a host of other mutual aid and leisure time groups, constitutes a necessary and vital complement to the network of producing and distributing relationships we call the economy. Without that complement the economy exists only as an abstraction, an academic fiction.

Normally the incidence of migration and resettlement is such that the integrity of few groups is severely threatened by the loss of old members or the clamor for admittance by potential new members. But the uprooting and redistribution in new combinations of large segments of metropolitan populations would produce social disorganization on a grand scale. Even the clusters of 50,000 left behind in the dispersion would find that the major parts of their social systems had been stripped away. Immediate reverberations in the economy would follow, the cumulative effect falling somewhere between a sharp decline in productivity and complete disaster. The probability of chaos is only partly mitigated by the containment of dispersion within metropolitan areas, for while the distance over which group relations extend has been greatly increased in the last fifty years, the upper distance limit for intimate and frequent association is approximately ten miles. Obviously, the disorder created would be contingent on the rate of dispersion and on the existence of relevant knowledge and skills for administering the program.

Conceivably, by a feat of social engineering, dispersion could be so organized as to move sizable population units with their respective groupings more or less intact. But there is not sufficient knowledge of the city's social structure to permit an estimate of the chances for success of an operation

of that kind. Prior experience with resettlement, particularly that acquired in foreign areas, would supply some useful lessons, though for the most part most resettlement programs to date have dealt with populations of but a few hundreds. The redistribution of large aggregates would uncover many unknown factors. For example, to what extent would any population of 5,000 to 50,000, when removed from an aggregate several times that size, include significant proportions of the members of the most essential groups? Unfortunately, the determination of "significant proportions" and "most essential groups" has yet to be made. Again, to what extent do groups, though their memberships are comparatively small, presuppose the existence of large populations? How far apart may the members of a group be scattered without seriously impairing the function or functions served by the group? Answers to these and many similar problems will differ by type of group. In time, of course, a reorganization may be expected to emerge with or without comprehensive planning and professional guidance.

In any case, an important requisite for an orderly dispersion would be an inclusive or metropolitan-wide municipal government endowed with adequate powers of eminent domain and taxation.

Dispersal in the degree suggested as a basis for this discussion is considerably less extreme than is found in many of the recommendations that have appeared in print. Yet it is difficult to escape the conclusion that even such a proposal, viewed as an urgent safeguard to be executed at the earliest possible moment, is simply not practicable. Not only the time allowed but the principle itself seems to be at fault.

If dispersal is to be merely a flight from the atomic bomb, the results are apt to be disastrous to the economy, and the metropolitan pattern that is established may have little other than defense utility. But peace is more enduring than war. A proper exercise of reason would favor a planned dispersal based on positive rather than negative values. A positive program holds forth the promise of a more efficient utilization of land, materials, and technical resource, the creation of more abundant opportunities for individual achievement, and the development of a more satisfying community life. It may take longer and it may cost more, but at least there would be something to show for the effort.

Letters to the Editor

DEAR SIR:

In the editing of my article "Long Term Prospects for Essential Minerals" in the August, 1951, issue, a table was omitted which makes the key argument unintelligible.

The ultimate limits upon the availability of many important minerals are set by the quantities which are present in the earth's crust, i.e., natural factors such as erosion have led to enriched deposits which are insufficient to meet the prospective world demand. The average concentrations in the earth's crust are to be found, roughly, in the most primitive rock, so that *maximum* costs and relative volumes of supply of these important minerals might be ascertained by studying some process which would extract all the useful components from such a raw material. The Table VI referred to at the bottom of column two, page 216, should actually be Table VII which is supplied below:

TABLE VII[1]

USEFUL MINERALS ACCOMPANYING 10^8 TONS OF IRON IN IGNEOUS ROCK OF AVERAGE COMPOSITION

Mineral Products	Volume (tons)	Approx. Value per ton ($)	Total Value (10^6)
Iron ore (magnetite)	150,000,000	14	2100
Magnesia	100,000,000	30	3000
Titanates and Ilmenite	24,000,000	50	1200
Manganese oxide	5,500,000	80	400
Phosphoric acid	3,000,000	200	600
Hydrofluoric acid	500,000	400	200
Chromium oxide	2,000,000	50	100
Copper	200,000	500	100
Nickel	200,000	1,250	250
Vanadium	200,000	2,000	400
Tungsten oxides	150,000	6,000	900
Tin	80,000	4,000	320
Zinc	80,000	500	40
Lead	30,000	500	15
Molybdenum oxide	25,000	6,000	150
Thorium	20,000	?	?
Uranium	5,000	?	?

[1] (Derived from Table 45, page 220, of Sverdrup's *The Oceans*, New York: Prentice-Hall (1942), and from currently quoted prices for industrial raw materials. Prices under future circumstances will be greatly modified, as was discussed earlier.)

Curiously enough, the energy content of the fissionable elements can provide many times more energy than is needed for grinding, processing, and reduction to ingots. If atomic power is at all possible on a large scale, one can imagine large, self-sustaining, continuous-flow, mulitproduct processing installations chewing away at the edges of mountain ranges, dumping wastes at the bottom of the ocean, and supplying ingots, ceramic powders, industrial chemicals, and power to a hard-pressed world economy. This appears to be technically feasible within a generation, but the economics depend upon the efficiency of atomic power generation.

Sincerely,
R. L. MEIER
Chicago, Ill.

RADIOLOGICAL MONITORING FOR CIVIL DEFENSE

J. B. H. KUPER

Are civil defense workers overemphasizing the complexities of radiation detection? This is the question which Dr. Kuper examines in the following article. From his experience with civil defense planning in the New York area he suggests a simplified plan for radiological monitoring. At present, Dr. Kuper is head of Electronics and Instrumentation at Brookhaven National Laboratory.

FOR the past eighteen months I have been an interested observer of the efforts to create a radiological monitoring system for civil defense purposes. The slow progress in this direction has been of increasing concern. Now some state and local authorities have decided not to wait any longer for advice from Washington, and it seems time to speak up before certain programs are "frozen."

For, it is my impression that too much attention has been paid in the past to instrument specifications and not enough to the team organization and the nature of the mission to be accomplished. The latter holds the key to the situation, which is not as complex as sometimes thought, and with care and training could easily be met.[1]

The importance of radiological monitoring as a civil defense function has sometimes been greatly exaggerated, but since there is a possibility of a radiation hazard—which cannot be detected by the senses directly—some provision must be made for handling it, if only for morale reasons. Popular ignorance and the natural fear of the unknown have combined to create a situation in which even police and fire departments—who already have far too many responsibilities in the event of atomic attack—are undertaking the functions of radiation monitors, supposedly for their own protection.

In view of the general fear of radiation hazards one shudders to think of the panic and confusion that will arise if instruments are used freely by personnel with inadequate training in their foibles and in the interpretation of results. Because of the complexities of gamma, beta, and alpha radiations, not to speak of the differences between external radiation hazards and those accompanying inhalation, swallowing, or injection with various radioisotopes, no single meter reading can even be sufficient for *all* situations. And no matter what care goes into the writing of instrument "specs" and how much of the taxpayers' money is spent on an instrument stockpile this unpleasant fact remains: the evaluation of a hazard and the supervision of emergency workers in a badly contaminated area require highly trained personnel.

[1] I want to emphasize that these remarks are personal conclusions and not official views of Brookhaven National Laboratory, Associated Universities, Inc., or the Atomic Energy Commission.

CONTAMINATION

Offsetting the fact that a serious contamination will require the services of skilled personnel with elaborate equipment is the fact that such contamination would exist, if at all, in only a small region. By far the greater part of a county subject to attack would be completely free of radiation hazard. In fact, except for an underwater burst, which might contaminate, say, ten square miles, one would expect that *well over nine-tenths* of the territory coming under one civil defense jurisdiction would be completely free of radioactivity. Even in the case of an underwater burst the clean area is many times larger than the contaminated, since the average size of the 92 largest cities in the United States is 53.8 square miles. The difficulty lies in the fact that an instrumental survey is needed to determine that a locality is clean. The situation is quite different from that of a fire or other catastrophe, the location of which is obvious.

The whole civil defense radiological problem falls in two parts: (*a*) to establish as quickly as possible which areas are clean, and (*b*) to cope with whatever special conditions exist in those areas found to be contaminated. The first part is in many respects the more important since it will probably affect by far the greatest number in their daily lives. Fortunately, it requires only simple instrumentation and comparatively unskilled personnel to determine that there is no significant radioactivity in a locality, if we have mainly to consider "fall-out" from an air burst or base surge contamination from an underwater (or underground) burst. It is possible to imagine, of course, situations in radiological warfare where a region showing less than 10 mr/hr on a "gamma only" meter might be unhealthy for long occupancy because of alpha contamination. But this sort of situation would not have the acute emergency character of an attack with atomic bombs, and, furthermore, it is unlikely that the enemy would go to the trouble of removing the gamma emitters from a mixture of radioisotopes just to fool the simpler radiation detection instruments.

RAY INTENSITIES

It has often been pointed out that the ratio between beta and gamma intensities encountered in a contaminated area may vary over a very wide range, and this is used as an argument that the civil defense monitoring instrument must have some response to beta radiation. This argument loses much of its weight, however, when applied to an instrument to be used for a prompt survey whose object is to determine that an area is clean. The abnormally high ratios of beta to gamma activity encountered after the Bikini "Baker" test seem in part to be due to biological concentration which takes appreciable time (especially in the temperate zones). Also, it is very unlikely that, even at the extreme ratios observed, a "gamma only" instrument would report an area clean when it had a *dangerous* beta contamination, since this still would have an easily detectable amount of gamma with it, not to speak of the *bremstrahlung*.

Granting the premise that it is important to designate clean areas as such just as quickly as possible, it is obvious that the radiological monitoring problem calls for two types of teams in widely differing numbers

with different levels of training and types of equipment. Merely to avoid confusing these, the members of those teams whose function is the simple decision that an area is clean or practically so might be called "radiological wardens," and the term "radiological surveyors" is applied to the better trained and equipped personnel. The latter would be able to evaluate dosage from a mixed radiation field, compute permissible working times for emergency personnel required to operate in affected areas, and to accompany such personnel to insure their safety in operations involving risk of really significant exposure (say over 10 r). These comparatively highly trained surveyors should not have to waste their time on initial survey operations. They should be organized on a mobile basis and be at the disposition of the state (or county in some cases) civil defense authorities—to be called in when the wardens discover a dangerous situation. This might be arbitrarily set at a gamma reading in excess of some such figure as 2r/hr at one hour after the explosion (correcting all readings to this epoch). An eight- to twelve-man team should be capable of handling any situation which might arise due to fall-out from an air burst, but in case of an underwater burst where the 2r/hr contour at one hour would enclose roughly ten square miles (with Bikini conditions of a 5 mph wind) it would be highly desirable to have at least two such teams present on a mutual assistance basis.

TWO TEAM MINIMUM

On the assumption that the surveyors must reach the scene of an explosion within a few hours, a minimum of two teams per state should be organized (except perhaps in the smallest states), and in states having more than one primary target area additional teams might be provided to equal the number of target areas. The teams should not be based within the critical target area and consideration should be given to dispersal of their equipment. I do not know the number or distribution of critical target areas by states but guess that the total number of survey teams desirable would be between 150 and 200.

The cost of equipping one of these survey teams would be rather high, but if the number can be held below 200 it should not be nearly so formidable a problem as trying to supply the wardens with instruments coming anywhere near meeting the specifications issued by the Federal Civil Defense Administration last December. The surveyors should have instruments (presumably ionization chamber types) capable of differentiating between beta and gamma rays. They must be supplied with individual pocket dosimeters and complete protective clothing. Serious consideration should be given to supplying them with oxygen-generating breathing equipment (such as the "Chem-Ox" mask). Certainly a few of these should be available to each team. Facilities for counting of smears and dust samples (including alpha counting) and for emergency assay of water samples should be provided in some sort of mobile laboratory which would serve as field headquarters for the team. This field laboratory need not be very elaborate since under the anticipated conditions the background would make really low-level work impossible. Good communication between the individual surveyors and their team headquarters is absolutely essential if teams of the size contemplated are to have any success at all in coping with the situation. This probably requires the provision of "handy-talkies" or "walkie-talkies."

DUTIES OF TEAM MEMBERS

Members of the survey teams will have to be well enough trained to permit them to function on detached duty accompanying fire-fighters, rescue squads, or emergency teams. In this duty they would have responsibility for the safety of the squad they are escorting and would advise the squad leader on all such matters as safe working times, protective clothing, or equipment needed, etc. This degree of competence will be hard to achieve, of course, but if less than 2000 surveyors are required the picture is not too black. Of course, mere technical training is not enough; personality is important since the surveyors will be called on to exercise judgment and provide leadership.

One might summarize the proposed surveyor teams by comparing them in degree of training and equipment to the teams comprising the "interim monitoring network" established by the AEC at various sites, including Brookhaven Laboratory. The members of the teams would have to include some who are sufficiently expert in electronics to maintain the instruments —which, of course, will not be as simple and rugged as those issued to the wardens. Given candidates with a high level of intelligence and preferably some background in engineering or physical sciences, a three weeks' intensive course would probably be sufficient.

REQUIREMENTS FOR WARDENS

The wardens, on the other hand, would require only simple equipment and a very slight amount of training. They would probably have no need for protective clothing, except perhaps a safety helmet, and pocket chambers rather than personal dosimeters would be adequate. Their instruments should be reasonably rugged and require essentially no maintenance. If they use batteries these should be of the ordinary flashlight type obtainable at any drug or hardware store. A "gamma only" instrument would be acceptable with a maximum scale reading of perhaps 5r/hr, provided that it does not paralyze but reads off-scale at the high end in radiation fields of several hundred r/hr. The job of locating contamination, if any exists, will be greatly facilitated if the instrument is a Geiger-Müller counter type and provided with headphones. With this sort of equipment a warden can cover clean territory very rapidly. If conditions permit he can ride in a slow moving vehicle; otherwise he can patrol as fast as he can walk.

The warden would be provided with markers or signs to be posted to indicate an area has been found clean, and also to designate any hot areas

(*Continued on page 320*)

News and Notes

by **Peter Axel**

NUCLEAR SUBMARINE

The Navy's Bureau of Ships announced that a contract for "the first nuclear-powered submarine" had been awarded to the Electric Boat Company of Groton, Connecticut. The August 21st announcement gave no details and no expected delivery date. Nine days later, Westinghouse Electric Corporation was given a Navy contract to build the driving mechanism for this submarine. This contract covered all the "propulsion machinery" such as special boilers and jumbo generators required to convert the intense heat of the nuclear reactor to usable motive power but it did not include the nuclear reactor itself.

Chairman Gordon Dean of the AEC commented on the nuclear-powered submarine at his July 30 press conference by saying "You can gauge our progress by the extent to which we become increasingly vague." Admiral William Fechteler, Navy Chief of Staff said on September 17 that he expected delivery of the submarine in "a couple of years."

In contrast with the scarcity of official information on the submarine is the 1¾ page article in the September 3rd issue of *Time*. The article is written around the figure of Captain Hyman George Rickover, who is said to be in charge of building the submarine for the Navy. *Time* gives many previously untold "facts." For example, the appearance of the submarine is given: "like an ordinary Tang-class sub (*Time*, July 9) only bigger and chubbier." The speed is also stated flatly as being: "25 knots for steady cruising, 30 to 35 knots in emergencies." The *Time* article is probably an attempt at clairvoyance; if not, it represents a serious breach of security.

NUCLEAR AIRPLANE

A contract which covers the design and construction of the airframe for a nuclear propelled airplane was awarded to Consolidated Vultee Aircraft Corporation on September 5. Neither the type of plane nor the scheduled completion time were given. The AEC had previously announced a contract with General Electric for the development of a nuclear reactor engine for the aircraft.

DEVELOPMENT OF ATOMIC WEAPONS

Two top Navy men have confirmed reports of the potential availability of atomic bombs for naval use. On September 11, 1951, Admiral Lynde D. McCormick, Commander-in-Chief of the U.S. Atlantic Fleet said, "Eventually, I think every carrier will be equipped with atomic bombs. Since their reduction in size they have become more available for carrier use." The Chief of Naval Operations, Admiral William Fechteler was even more explicit on September 17 when he said that crews of two carrier-based aircraft—the P2V Neptune patrol bomber and the AJ attack plane—had already been trained to launch A-bombs.

The rumored use of atomic warheads on guided missiles was given credence by the terse statement from the Joint Congressional Committee on Atomic Energy on September 17. After hearing testimony from K. T. Keller, former Detroit manufacturer who now directs the guided missile program and his deputy, Major General K. D. Nichols, the committee reported that it had "received a report on guided missiles particularly from an atomic energy viewpoint."

GUIDED MISSILES

Two guided missiles, the "Corporal E" and the "Matador" were unveiled in September. The "Corporal E" was announced on September 19 as an improved version of the Wac Corporal rocket which had reached an altitude of 250 miles when launched from a V-2. Corporal E was described as a research instrument and not a combat weapon.

On September 13 the Air Force announced that it would establish a guided missile squadron for training personnel in the tactical use of pilotless bombers at its test center at Cocoa, Florida, on October 1st. Concurrently a photograph was released of the B-61 Matador pilotless bomber which is produced by the Glenn L. Martin Company of Baltimore. No detailed data of the new missile were made available but this lack of information merely started the "experts" explaining.

James M. Minifie, writing for the New York *Herald Tribune* on September 14 said that it was one of the "fantastic" weapons to which Truman had referred. The caption appended to the Air Force-released photograph flatly states that the speed is more than 1,000 m.p.h. although in the text Mr. Minifie cautiously inserts "presumably."

Mr. Joseph Alsop, in his September 22 column is much more skeptical. He says "Maybe there really are wonder weapons which will win wars miraculously. But it is also well to remember that the reports about these weapons are generally phoney. For instance, the "Matador" guided missile's top speed is known to be subsonic and its guidance system is reported to be far from refined. For these reasons one of the great experts in the field has described the Matador as 'representing a great increase in expense but little improvement in performance over the German V-1 weapon of the last war.' Behind the loud Air Force clamor about the Matador one detects the tensions of the bitter inter-service struggle over control of guided missiles."

ATOMIC TEST PROGRAM

The AEC has announced that it would resume test operations at the Nevada Test Site "in the near future." The experimental program will include detonations of both ordinary high explosives and nuclear explosives. Only a limited number of official observers will be permitted to view these tests. However, the AEC has expressed hope that it could have some subsequent test operation which could be witnessed by representatives of the press and radio as well as civil defense authorities.

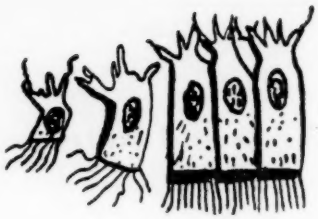
Plans for the first military maneuvers to include atomic weapons were disclosed by the defense department on September 17th. A 5,000 man force from all three armed services will be under the direction of Major General William B. Kean at the Nevada Test Site. The one announced exercise will include the establishment of trenches, barbed wire and combat emplacements which will be tested by the atomic blast. The troops will withdraw to "predetermined positions of safety" before the explosion.

The relationship between the Eniwetok Proving Grounds and the Nevada Test Site was covered by Chairman Dean at the AEC press conference on July 30th. After indicating that the Eniwetok tests were longer than the earlier Nevada tests from both the standpoint of logistics and the energy release, Chairman Dean said: "I think you can conclude that when they (i.e., the weapons) get very large we take them farther away from people. . . . That is basically the reason why we have the two proving grounds."

SECURITY

Officials of the International Congress of Pure and Applied Chemistry, which met in New York on September 10, reported that some of the world's top scientists had been denied visas because of security regulations.

Professor Marcus E. Oliphant, one of Australia's foremost atomic scientists, announced on September 14 that he had been forced to cancel a projected trip to the United States because his visa failed to arrive. In Washington, State Department Officials claimed the delay was "administrative" and did not involve the Internal Security Act. Dr. Oliphant had been planning to attend a University of Chicago sponsored International Physics conference during the week of September 16th.



SECRECY OR DECLASSIFICATION

Representatives of the United States, the United Kingdom and Canada met in Washington from September 14 to 16 for their fifth International Declassification Conference. The three nations use uniform Declassification Guides in determining what information jointly known to them from their atomic energy research work may be published. These guides were initiated during the period of wartime cooperation and have been revised and coordinated annually since then. As a result of last year's meeting in Canada (February, 1950) some information on low power reactors was released. Recommendations from this year's meeting will have to be discussed by atomic energy agencies of the three governments before any revisions are made.

ATOMIC ENERGY ABROAD

The successful test runs of Scandinavia's first atomic reactor were reported by the reactor director, Dr. Gunnar Randers, on July 31st. The 100 kilowatt reactor, which is located at Kjeller, Norway, is operated as a joint Norwegian-Dutch project and is scheduled for an official opening in either October or November.

Whisper . . .

"General Hoyt Vandenberg, Air Force Staff Chief, announced plans for an atomic airplane as a gesture to offset the Navy announcement of an actual order placed for an atomic-powered submarine. Air Force does not want the idea to get around that it does not have first call on atomic power."

—From the column, "Whispers," in *U.S. News & World Report*

GOVERNMENT RESIGNATION—INDUSTRIAL APPOINTMENT

Dr. Edward U. Condon resigned his $14,000 a year post as the director of the National Bureau of Standards to become research director for the Corning Glass Company at Corning, New York. Dr. Condon said that, despite the satisfying nature of his work, he could no longer afford "the severe financial sacrifice involved" in government employment.

In accepting the resignation with regret, President Truman expressed appreciation for the time Dr. Condon had given to government service. The President also declared: "You have served in a most critical position with continued and loyal attention to your duties as director, and by reason of your standing among scientists and the supervision you have given to the bureau's activities, you have made of it a more important agency than it ever has been before."

Despite the fact that Dr. Condon was leaving government service, Rep. Vail and Rep. Velde, Illinois Republicans, attempted to use the resignation to renew their twice disproven smear charges against Condon.

M.I.T. PROFESSOR INDICTED

Dr. Dirk Jan Struik, professor of mathematics at the Massachusetts Institute of Technology, was suspended from his job as a result of being indicted by a Middlesex County grand jury. Prof. Struik was accused of conspiring with others to advocate the forcible overthrow of both the state and the federal governments. The grand jury acted under a state law revised in 1948 which forbids the teaching of forcible governmental overthrow by speech or by distribution of documents. The constitutionality of the law has never been tested. Prof. Struik admits to being "a Marxist scholar" but has denied being a communist.

(Editor's Note: In the Spring of 1949, James Rhyne Killian, President of M.I.T., made the following statement concerning his institution's position towards Professor Struik:

". . . The Institute believes that Professor Struik, who denies that he has committed any crime, should be considered innocent of any criminal action unless he is proved guilty. The Institute feels that if criminal charges are to be brought against Professor Struik, they should be brought by the government and handled in orderly fashion by the courts. An educational in-

stitution has no competence to carry on a trial to determine whether a law has been broken.

"Should a member of our staff be indicted for advocating the violent overthrow of the American government or other criminal acts, or if the evidence of such actions were incontrovertible, immediate action would be taken which would protect the Institute and at the same time preserve his rights. If this staff member should be convicted of this charge, he would be discharged.")

AEC APPOINTMENTS

The expanded atomic energy program has created a series of new important administrative positions. Major General Thomas F. Farrell was appointed Assistant General Manager for manufacturing. His responsibilities include the management of all atomic energy work concerned with getting supplies of uranium and other raw materials, the processing of these materials, the operation of the production plants (Oak Ridge, Savannah River, Hanford and Paducah), and the construction of new production facilities. General Farrell is on military assignment to the AEC from the Army, where he was Deputy Administrator of the Defense Production Administration; he is on military leave from his post as Chairman of the New York Housing Authority.

Robert L. Corsbie has been appointed Chief, Civil Defense Liaison Branch of the Atomic Energy Commission's Division of Biology and Medicine. His responsibilities for liaison with the Federal Civil Defense Administration and other government and private agencies will cover the problems concerned with the effects of atomic weapons. These will include treatments for radiation injuries, general methods of protection and advances in building structures to minimize both the radiation and blast effects of A-bombs.

Dr. Donald H. Loughridge, formerly Scientific Advisor to the Secretary of the Army, has been appointed Assistant Director of the AEC Division of Reactor Development. As assistant to Dr. L. R. Hafstad, Dr. Loughbridge will supervise and coordinate the reactor programs at the Argonne National Laboratory, the Knolls Atomic Power Laboratory, and the Oak Ridge School of Reactor Technology.

Col. Kenneth E. Fields has been appointed Director of the Division of Military Application of the AEC, succeeding Brig. Gen. James McCormack, Jr., who has been assigned to U.S. Air Forces Headquarters. Col. Felds will be responsible for the Commission's atomic weapons program and will supervise the Santa Fe Operations Office at Los Alamos.

GENERAL ELECTRIC OPERATIONS

The AEC has extended until June 30, 1956, its contract with General Electric for the operation of the Hanford (Washington) Works and the Knolls Atomic Power Laboratory in Schenectady, New York. Under the contract the government pays all costs and a token one dollar annual fee. G.E. has been operating the Hanford plutonium plant since September, 1946. With the termination of this original contract, G.E. is refunding about ten million dollars in unused reserve funds. In addition to the production operation, G.E. will continue to manage the government-owned town, Richland, Washington. The AEC will award any future construction contracts related to these projects, thereby relieving G.E. of this responsibility.

ACADEMIC APPOINTMENTS

Dr. Bernard Peters, who had had difficulties in obtaining a passport to India, has decided to move to that country. Dr. Peters resigned from his position with the physics department at the University of Rochester to accept a special chair in cosmic ray research and teaching at Tata Institute in Bombay, India. Dr. Morton F. Kaplan succeeded Dr. Peters as head of the cosmic ray group at Rochester.

Dr. Joseph B. Platt has returned to the University of Rochester physics department after having spent two years as the chief of the physics branch in the AEC research division in Washington.

Inglis and Flanders: A Deal before Midnight

(*Continued from page 306*)

Such a group should be unhampered by secrecy restrictions and should be free to solicit aid from any relevant government agency. It should be charged with the task of assessing the assurances and risks, the advantages and disadvantages, of various controls schemes that have been proposed, but especially with devising new schemes that might have better chances of political success. The fact that isolated thinkers pre-occupied with other problems have failed to turn up better schemes does not mean that they cannot be found.

The group must clearly have not only scientifically and technically trained members but also men versed in politics, statecraft and perhaps also mass psychology and other specialties, since any technically sound results must be put into a form that has the best prospect of acceptance in spite of world tensions, and the framing of prospective agreements will require attempts to maximize the desirability to both sides, perhaps even balancing concessions inside and outside of the field of atomic energy, and attempts to minimize the economic sacrifices and military risks involved.

The fact that the group would have direct responsibility to the highest administrative authority should make it possible for the President to obtain the full-time services of creative men of the highest calibre.

The Acheson-Lilienthal Committee gave an example of the imaginative approach and mutual stimulation that such a group can achieve. Group effort has led to the solution of difficult problems in the past. It should be fervently applied to this all-important problem, on whose solution hinges the uninterrupted progress of civilization among mankind.

A Wellsian Forecast

". . . The catastrophe of the atomic bombs which shook men out of cities and businesses and economic relations, shook them also out of their old-established habits of thought, and out of the lightly held beliefs and prejudices that came down to them from the past."

—H. G. WELLS, in
The World Set Free (1914)

Editorial

INTERNATIONAL MEETINGS

September has seen in the U.S. several international gatherings of scientists. Chemists from all over the world converged on New York to attend a Jubilee Meeting of the American Chemical Society and, immediately following it, the Congress of the International Union of Pure and Applied Chemistry. Later in the month, a week-long symposium on Nuclear Physics attracted to Chicago distinguished physicists from Europe and Asia. This international attendance is an outward demonstration of the leading position the U.S. has acquired in the world of science—partly through indigenous growth, and partly because war and totalitarian oppression have delayed the progress of science in other parts of the world and caused many leading European scientists and science students to settle in America.

While American science was demonstrating its growth, the American government was making a demonstration of provincialism and immaturity, which the American hosts of the scientific meetings had trouble to explain plausibly to their guests.

When the great chemical meeting in New York approached, it turned out that even some official delegates of friendly nations would not be able to attend—despite the efforts of the National Research Council, the American Chemical Society, and even the Department of State, to help them obtain their passports. Among those unable to come were the leader of the Italian delegation, Professor Giordini and a member of his delegation, Professor Natta. Famous chemists, such as Dr. Ruzicka, the Polish-born Swiss chemist who has received the Nobel prize for his outstanding work on complex natural compounds, and Mlle. Perey, who acquired fame by the discovery of francium, one of the last missing elements in the periodic table, were "left behind."

According to newspaper reports, and unfortunately no more information is available, Dr. Ruzicka had trouble getting his visa because of honorary membership in the Czechoslovakian Chemical Society. Every American scientist would have been honored by a similar distinction from *any* foreign professional organization, and would cherish it until and unless the Society were to do something he considered professionally offensive. (Thus, some American members have renounced their membership in the Soviet Academy in indignation over the latter's endorsement of the purge of Russian genetics; but it would not have occurred to them to do so merely because of the political conflict between America and the Soviet government.) According to the same reports, Mlle. Perey got into difficulty—from the point of view of the McCarran Act—because she had once invited Madame Joliot-Curie, her Nobel prize-winning colleague, to the dedication of her laboratory! Both Dr. Ruzicka and Mlle. Perey finally received visas, but it was too late for them to make the trip.

The E.C.A. and the Ford Foundation had appropriated over half a million dollars to make it possible for European chemists to attend the New York meeting. The degrading treatment of distinguished scientists by the American government must have done much to offset this demonstration of goodwill. Next time, when the question arises as to where an international scientific meeting should be held, foreign scientific societies will be fully justified in suggesting that a country should be chosen where no such affront to their delegates would be possible.

If the Soviet Government relaxes its ban on foreign travel by Russian, Polish and Czech scientists, scientific gatherings—including those of the American professional societies—will be only too glad to welcome their colleagues back into the fold. No European government will be likely to obstruct their coming—except perhaps that of General Franco. Under the McCarran Act, however, these visitors would have to be barred from the United States (unless they travel as diplomatic representatives of the Soviet Union.) This alone would make the United States, in the eyes of most Western scientists, ineligible as site of a major international scientific meeting as long as the present legislation is not amended.

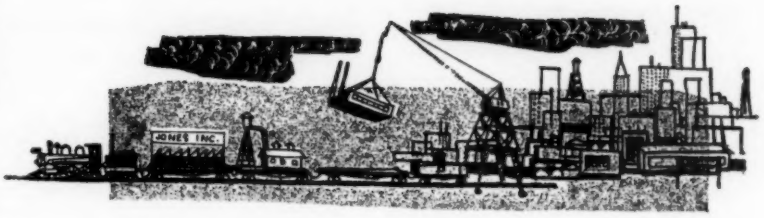
Months ahead of the Chicago meeting lists of foreign scientists to whom invitations were to be sent, were given to the State Department to ensure that none would be disqualified. Scientists such as Joliot of France or Blackett of England, whose communist (or pro-communist) political leanings were known, were left out from the list in the realization that in the present climate of unreasoning intolerance—of which the McCarran Act is the legal manifestation—there was no chance of their admission. Despite this precaution, when the time of the meeting approached, no assurance could be given that the invited guests would be able to come. In fact, up to the last moment it was quite uncertain whether any one of them would attend, with the consequent confusion in the organization of the meetings. Finally, all but a few showed up, but two prominent visitors, Professor Oliphant of Australia and Dr. Kowarski of France, were missing. A prominent British guest—Professor Peierls—was able to travel in time only because he happened to be the British representative on the Joint Declassification Committee (which decides what atomic energy data of the U.S., Britain, and Canada should be released!); the meeting of this happened to coincide with the conference, giving him the chance to travel on the diplomatic passport without waiting for the regular visa.

The foreign guests received profuse apologies from their American hosts. The guests answered in good grace, that they were happy to be here, and that even their colleagues who were unable to make use of their invitations, were thankful for having been invited and understood the difficulty of their American friends.

This exchange of compliments should not make us forget that chicaneries of this type support in Europe, and in other parts of the world, the picture of American political system as immature, lacking in discernment and dominated by an irrational anti-Communist hysteria. This is grist for the mills of Communist propaganda. What good is it to quote the major political acts of the United States in the last few years as proofs that American policy is fundamentally humanitarian, rational and enlightened —if these major lines of American policy are obscured by the strange quirks of American administrative practices?

Similarly, authentic statements of American political intentions appear to be given the lie by irresponsible pronouncements of prominent Americans, often in high administrative positions.

During the Chicago meetings of atomic physicists a lot of politics was bandied around lunch tables, (in addition to a much larger lot of nuclear physics). On this occasion, one could see how, even in the minds of the best friends of America, conviction lingers that Americans are an immature and impulsive nation, whose policies, unless tempered by advice from more mature friends, may wreck world peace and destroy her own freedoms.

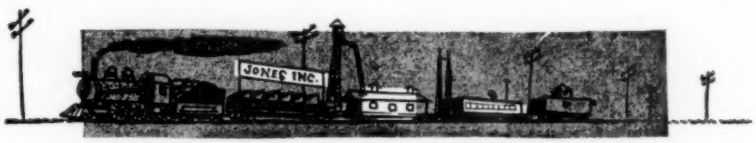


In support of such assertions, no major international act or internal legislation was quoted, but only rash, off-the-cuff statements by American politicians, or excesses of congressional and Administrative campaigns against real or imaginary communist "infiltration."

The incident with the entry permits of foreign scientists is not the worst example of such excesses, but it is the kind most likely to receive world-wide unfavorable publicity.

E. R.

CIVIL DEFENSE AND THE *BULLETIN*



The September issue of the *Bulletin* was entirely devoted to the subject of "Dispersal"—decreasing the vulnerability of American cities to aerial attack through the method of decentralizing industry.

Since that issue, President Truman's announcement of a second Soviet bomb has underlined the importance of this problem, which is so easily forgotten in the long intervals when the atomic armament effort of nations other than America seems remote and almost unreal.

It is an issue which will receive more and more attention as it becomes more clear to America that her "monopoly," never as complete as many thought, has now all but vanished.

Although dispersal has not received much attention in the general press, the *Bulletin* found, upon inquiring for contributors to prepare articles, that many persons were interested and had done worthwhile planning on the subject. In the end we received many more suggestions that we could follow up; we are printing an additional article on dispersal in this issue and will plan others for later issues of the *Bulletin*.

Because we devoted last month's entire issue and a good part of this month's issue to defense issues, we are not running the usual column of Civil Defense Notes this time.

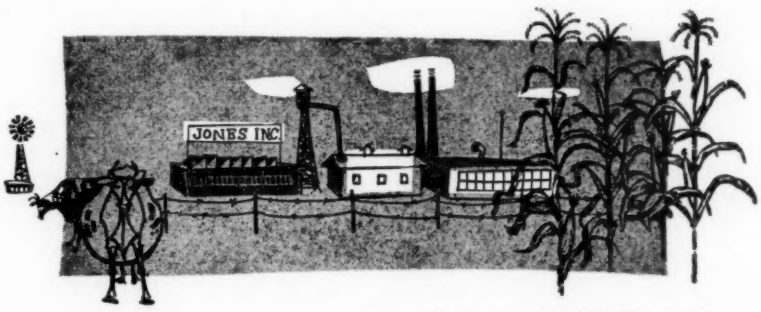
However, for several reasons, the *Bulletin* will continue to follow closely developments in this field. For one thing, citizens who have been working in civil defense planning find themselves interested not only in CD but in the larger issues of peace and war—and alternatives to the arms race. When people have thought about atomic bombing as it might really come to *us*, they think about those issues which interest other readers of the *Bulletin* and which are the primary concern of this journal. In addition, the handling of secrecy and loyalty procedures in civil defense has begun to take an all-too-familiar pattern, one in which the *Bulletin* feels sadly at home.

Third, civil defense poses an enormous problem in mobilization of people and skills, and, to some extent, the experience of our contributors may be of service, for many are veterans of World War II mobilization.

Fourth, here, as in many other aspects of other problems in the past, there may exist no body of expert opinion and no center where real coordination is attempted in the evaluation of the realities. This journal may not find the answers, but at least may ask some questions. Where the *Bulletin* sees an opportunity to present facts and opinions bearing on science and society, which other journals seem not to consider in their field, we shall not hold back a tentative venture to see whether they are in *our* field.

Such an issue was "dispersal." It has been discussed among physical scientists and some social scientists for years; still government agencies and general magazines ignored the subject. As various people urged the *Bulletin* to publish some preliminary discussion of the subject, it became clear that last month's special issue would find an audience.

The *Bulletin* invites new and old readers to send suggestions on what other significant issues might be discussed appropriately in the pages of this journal of science and public affairs.



Cuts on this page by courtesy REPORTER magazine

(*Continued from page 314*)

he might find. If he should discover a region showing more than a predetermined amount of radiation, say 100 mr/hr at one hour after explosion, he should report the fact as promptly as possible to his team chief. The latter would be responsible for checking the report and, if verified, for notifying the authorities in charge of dispatching the surveyors. The warden teams would then do what they could before arrival of the surveyors to locate and mark the 2r/hr contour. They should be instructed not to go beyond this point unless specifically directed to do so for some emergency work.

Since the wardens would not be difficult to train nor expensive to equip, it would be possible to have a large number of teams, based on the population density. It would seem feasible to have at least one team per high school throughout the country, with additional teams in cases where the high school has more than 1000 students. This may require a total of about 30,000 teams, each consisting of perhaps eight wardens (male or female) and a chief and deputy chief. A few nights' instruction with occasional refresher drills should be sufficient training for a warden. There should be a somewhat broader training program for the team chiefs. It is quite possible that the surveyors may be used as instructors for the chief wardens, who should be capable of training their own team members.

If schools are set up to train the surveyors it would be a good idea, particularly in target areas, to permit the chief wardens to take the surveyor course if they desire. This would help greatly to improve the teamwork between the wardens and surveyors, at the same time furnishing a source of replacements for the surveyor teams.

This is not the place to go into details of the operations and organization of the classes of monitoring teams, rather it is intended to call attention to the practical necessity for two types at different levels. By simplifying the functions of the lower level teams we can provide them in adequate numbers and at the same time furnish the more skilled group with much better facilities than they would otherwise have. It seems certain that this scheme would provide the population with better protection at a lower over-all cost, than some of the programs now apparently receiving serious consideration.

"News Chronology"

(*Continued from page 304*)

October 6

In an interview given to *Pravda*, Premier Joseph Stalin said the Soviet Union would conduct tests of "atomic bombs of various calibers."

He said the tests would be made "under the plan of the defense of our country from attacks from the British-American aggressive bloc."

The interviewer from *Pravda* asked, "In connection with the tests on atomic bombs, public figures in the United States raise a hullaballoo and shout about a threat to the security of the United States of America. Are there any grounds for such alarm?"

Stalin replied: "There are no grounds for such alarm. Leaders of the United States of America cannot fail to know that the Soviet Union is not only against the use of the atomic weapon but is also for its prohibition, for the cessation of its production."

(This and other remarks of the Premier were widely interpreted as hints that atomic negotiations would be welcomed by the Russians).

"As is known," the Stalin statement continued, "the Soviet Union has several times demanded the prohibition of the atomic weapon, but it has each time met the refusal of the powers of the Atlantic bloc.

"This means that in the event of a United States attack on our country, the ruling circles of the United States will use the atomic bomb. Precisely this circumstance compelled the Soviet Union to have the atomic weapon in order to be fully armed to meet the aggressor.

"Of course the aggressors would like the Soviet Union to be unarmed in the event of their attack upon it. But the Soviet Union does not agree with this and thinks that in full preparedness the aggressor should be met. Consequently, if the United States is not thinking of attacking the Soviet Union, the alarm of leaders of the United States should be considered as pointless and false, for the Soviet Union does not contemplate ever attacking the United States or any other country.

"The leaders of the United States are displeased that not only the United States but also other countries and primarily the Soviet Union possess the secret of the atomic weapon. They would like the United States to be a monopolist in the production of the atomic bomb so that the United States would have an unrestricted opportunity to scare and blackmail other countries."

In answer to *Pravda*'s question:

"What do you think regarding international control in respect of the atomic weapon?"

The Premier replied:

"The Soviet Union stands for the prohibition of the atomic weapon and for the discontinuance of the production of the atomic weapon. The Soviet Union stands for the establishment of international control so that decision concerning the prohibition of the atomic weapon and concerning the use of atomic bombs already produced exclusively for civilian purposes will be fulfilled with all exactness and conscientiousness. The Soviet Union stands precisely for this international control.

"The American leaders also talk about 'control,' but their 'control' derives not from a discontinuance of the production of the atomic weapon but from a continuance of such production and in such quantities as coincide with the quantity of raw materials at the disposal of some countries or others.

"Consequently, American 'control' derives not from a prohibition of the atomic weapon but from its legalization and legitimization. Thereby the right of warmongers to annihilate tens and hundreds of thousands of the civilian populace by means of the atomic weapon is legalized.

"It is not difficult to understand that this is not control but a mockery of control, the deception of the peace-loving aspiration of the peoples. It is understandable that such 'control' cannot satisfy the peace-loving peoples who are demanding prohibition of the atomic weapon and the discontinuation of its production."

October 6

Three Senators called on President Truman to give the military authority to use tactical atom bombs in Korea whenever the situation was 'ripe.'

"If we have them, what are we waiting for?" asked Senator Edwin C. Johnson, Democrat of Colorado, a member of the Joint Committee. "There are plenty of likely targets in Korea."

Senator Hickenlooper said the decision of when and where to use them should be left entirely to "the professional military experts."

Senator Harry P. Cain said that tactical atomic weapons should be supplied "at once" to General Matthew B. Ridgway, the United Nations commander in Korea.

The Tools of Science

● Perhaps more than test tubes and laboratories, books are the tools of science. They spread the theories and techniques that lead to further progress. But war-depleted and underdeveloped countries in Europe and Asia lack the dollars to buy the new books so easily available here. And so their physicists . . . chemists . . . agronomists . . . scientists in every field . . . are cut off from current knowledge. They need help . . . your help, through the CARE-UNESCO Book Fund to provide overseas libraries, universities and other educational centers with the latest and best scientific and technical volumes.

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